The Refrigeration Service Engineer

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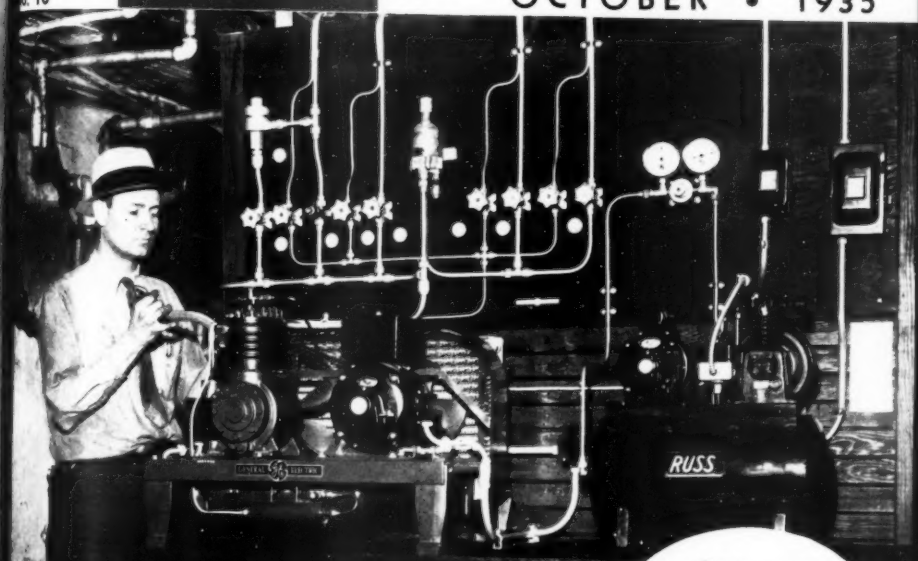

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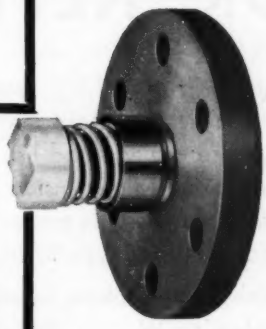

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The REFRIGERATION SERVICE ENGINEER

Devoted to the Servicing of
REFRIGERATION UNITS *and* OIL BURNERS

VOL. 3 | OCTOBER, 1935 | NO. 10

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COVER

THIS month's front cover shows an installation by Mr. H. H. Hauer, Milwaukee, Wisconsin. The equipment consists of: a GE-Model CMSA ¾-hp. condensing unit; Russ instantaneous beer cooler — two taps; finned evaporators in walk-in cooler and bottle refrigerator—both at same temperature and controlled by a snap-action suction line valve; Fedders flooded evaporator for cube making; Russ air pump for air pressure on kegs; all shut-off valves on panel board; air pressure gauges on panel board; panel board — veneer stock, ¾ in. thick, painted dark oak.

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R S E S

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The Refrigeration Service Engineer

A Monthly Illustrated Journal Devoted to the Interests of the Refrigeration Service Engineer in the Servicing of Domestic and Small Commercial Refrigeration Systems and Oil Burners

OFFICIAL ORGAN REFRIGERATION SERVICE ENGINEERS' SOCIETY

VOL. 3, NO. 10 CHICAGO, OCTOBER, 1935 $2.00 per Annum

When Winter Comes What Other Service Work Will Fill In

This Article Suggests the Possibility of Servicing Carbonators to Help Fill in Off Peak Refrigerator Servicing.

By PAUL JACOBSEN*

WINTER is coming on and the service men are beginning to wonder how much business they are going to get during this next winter.

A lot of people shut down their refrigerators—others let them run until they break down and then just shut them off, and in the meantime the service men who were so busy all during the summer are wondering what to do.

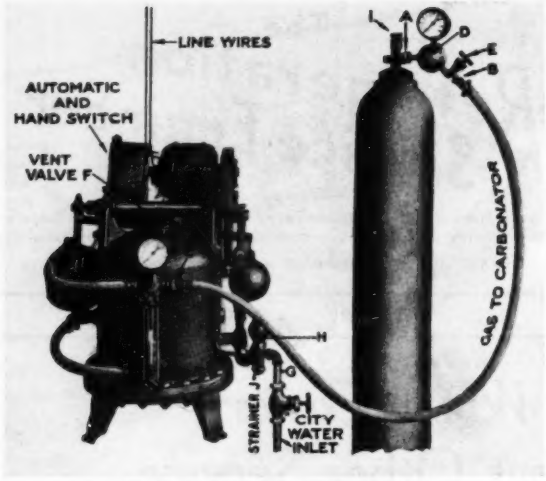
It occurred to me the other day that very few refrigerator men service allied equipment such as carbonators, and I thought it would be a good idea for the service men to take up the servicing of these machines, as they are rather simple in construction and are being used and do break down no matter whether the weather is hot or cold. I do hope that this article may help a number of service men over the tough winter months and suggest that you have stickers printed advertising your carbonator service and visit all the local drug stores. The result might surprise some of you.

Be sure that you understand what you are doing when working on carbonators, as the gas tanks have a very high pressure on them and serious accidents may happen if you do not use your head.

Parts may be bought for the various carbonators by writing the manufacturers, and where manufacturers are out of business the parts may easily be made up in a local machine shop.

Suggest to the druggist that he have his carbonator cleaned up and painted—oiled and tightened up at least once a year, and by having that done during the winter he may insure himself trouble-free service from his carbonator during the next summer.

* President, Dependable Refrigeration Service, President, Chicago Chapter R.S.E.S.



BILT-RITE AUTO ELECTRIC CARBONATOR.

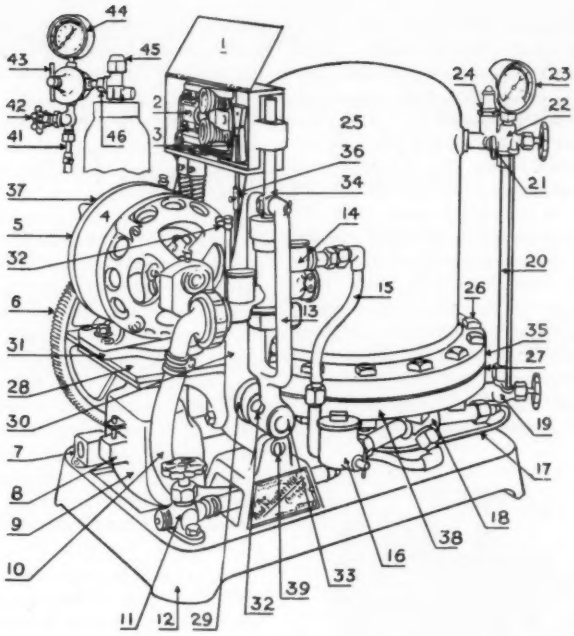
Servicing a Carbonator

Wherever soda fountains are used you will generally always find a carbonator connected because it is more economical to manufacture your own soda water than to buy the soda water in tanks such as was common ten or fifteen years ago. The carbonator is a rather simple piece of machinery. It consists of a water tank, a water pump and electric motor, a gas tank and a regulating valve. The water tank is made either of steel or cast iron and has a lining which is made of blocked tin sheeting. Inside this water tank you will sometimes find an agitator which consists of two arms with a paddle on each end. This arm is mounted on a shaft extending through the tank and generally driven by a chain from the pump axle. There's nothing else inside this water tank which can get out of order. The water pump is mounted on the outside of the water tank and consists of an ordinary small piston. It has a check valve on each side of the pump housing. One valve opens on the up stroke of the piston. The other valve opens on the down stroke of the piston. To the valve which opens on the up stroke of the piston, we connect the city water supply. Whenever the piston goes up, the check valve opens and some water is admitted into the pump. On the down stroke, this check valve closes and the discharge check valve opens and admits the water to be pumped into the water tank.

The gas tank, which is a drum of carbon dioxide gas (CO_2), is purchased from the local carbonic gas dealers. It generally has approximately 1,200 lbs. pressure on it. A pressure reducing device with gauge is attached to the drum and the line is connected from the pressure regulating valve to the water tank of the carbonator. The valve on the gas tank is opened and the pressure regulating valve adjusted to approximately 90 to 120 lbs. pressure. This gas—such as admitted into the water tank—mixes with the water through the action of the paddles and agitator inside the water tank.

The electric motor is mounted on top of the carbonator and drives the water pump by means of a small pinion on the motor shaft, driving a large gear on an overhead axle. This axle, in turn, through eccentric and connecting rod, drives the water pump.

On the side of the water tank is a gauge glass so that one may at all times observe the level of the water in the tank. A float ball is connected to the water tank with a couple of pieces of flexible hose and is attached to a rocker arm which has a counter weight in the opposite end to balance it.



PARTS LIST

1 Switch Box Cover.
2 Knife Switch.
3 Automatic Switch.
4 Motor.
5 Motor Pinion, not shown.
6 Gear Wheel.
7 Electric Service Connection Box.
8 Balancing Arm and Swivels.
9 Counter Weight.
10 Water-in Connection and Strainer.
11 Soda-out Connection.
12 Base.
13 Drive Arm.
14 Pump, see detail.
15 Back Pressure Check Connection.
16 Back Pressure Check Valve.
17 Gas-in Connection and Valve.
18 Body Inlet Fitting.
19 Lower Gauge Cock.
20 Gauge Glass Tube.
21 Body Vent.
22 Upper Gauge Cock.
23 Gauge.
24 Safety Valve.
25 Body with Lining and Fittings.
26 Body Bolts.
27 Body Gasket.
28 Motor Bracket.
29 Drive Shaft
30 Frame.
31 Motor Sub-base.
32 Oil Cups.
33 Drive Shaft Collar.
34 Pump Plunger.
35 Body Ring.
36 Automatic Switch Control Rod.
37 Gear Guard, not shown.
38 Bottom with Lining and Fittings.
39 Pivot Bolts.
41 Gas Leader Pipe.
42 Regulator Out-let Valve.
43 Regulator Adjusting Screw.
44 Regulator Gauge.
45 Gas Drum Valve.
46 Regulator In-let Coupling.

PARAMOUNT ELECTRIC CARBONATOR

As the water fills up in the tank, it flows through the rubber hose into the float ball and gradually fills it up and when the weight of the float ball overcomes the counter weight, the float ball tips and shuts off the machine through an automatic switch. This automatic switch should be adjusted so that the machine shuts off when the gauge glass is about ⅞ full and starts up again when the gauge glass is about ⅛ full.

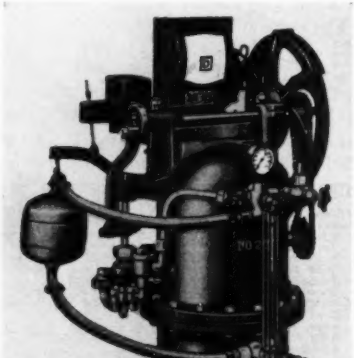
The line from the bottom of the tank leads to the cooling coils in the soda fountain where the water is cooled, and from the cooling coil, the water flows to the draft arms where it may be drawn as needed.

Shooting Trouble

The majority of service calls on a carbonator are for gas or water leaks. If the leak is in a place that carries charged water, you will see a thin stream of water coming out. If the leak is in the gas line, it is necessary to test with soap suds in order to locate the leak. Most of the connections are

soldered and blocked tin pipe is used. It is, therefore, necessary that one have a small alcohol torch with which to repair these connections if any are broken. The water pump may leak around the packing. This is remedied by repacking the stuffing box with hydraulic packing. This may be purchased from any manufacturer of packing. Should a leak occur in the soda cooling coil which is generally submerged in the water, bubbles will come up through the cooling water, making it easy to determine a leak at this point.

If the check valves at the water pump are leaking, the carbonator will receive an insufficient supply of water and the machine will run continuously, and it is possible to lose the complete charge of gas, as the carbonic gas has a higher pressure than the city



POLAR CARBONATOR.

water and may leak back into the city water lines. To determine whether this is the case, disconnect your city water supply line and observe whether gas is blown back from the carbonator. These check valves are either ball or rubber valves and may be either ground in or replaced with new ones.

A safety valve is located on the water tank and adjusted to open at about 200 lbs. pressure. Should this valve fail to reseat properly, it is best to take the valve off and return it to the manufacturer who will either ship a new one or repair the old one. Do not attempt to make adjustments on these valves, as the carbonator may blow up if this valve fails to release at the proper pressure.

When starting up an empty carbonator, start the machine first and allow it to run for several minutes to make sure that everything works freely. Open the city water supply valve and allow the carbonator to pump enough water so that it just shows in the bottom of the gauge glass. Now open the valve on the carbonic gas drum and regulate it to about 90 lbs. pressure. Allow carbonator to operate until full, and while waiting, open air vent on top of carbonator three or four times to allow air which has accumulated to escape. Check the system for leaks, oil the motor, gears and chain drive—check the fuses and see that the proper size fuses are used. Check the switch points and see that they are not burned or corroded, and be sure that the carbonator shuts off before you leave.

If your supply of gas runs low, the water will become flat. Connect a fresh drum of gas to the regulating valve and adjust to 90 lbs. pressure. Open the draft arms on the soda fountain and allow all the flat water to run out of the carbonator and permit it to fill up again—blow out accumulated air in the water tank and check for leaks.

Some carbonators have a water strainer where the city water enters the water pump. This strainer may need cleaning from time to time. A gas check valve on the carbonator prevents the gas and water from escaping when changing the gas drums. When changing gas drums, use a new fibre washer as fibre washers are cheaper than gas.

Clayton Lovejoy,
New York.

I think the R. S. E. is a mighty fine magazine and I enjoy reading every issue.

M. J. Erker,
Montana.

I think it is the greatest little trade magazine published. I read it from cover to cover and always find something interesting and new.

The Operation of the Automatic Suction Pressure Throttling Valve

The Operation and Installation of the Automatic Suction Pressure Throttling Valve. Its Construction and Adjustment.

By O. F. NELSON*

THE automatic suction pressure throttling valve installed at, or near, the suction inlet port of the compressor will relieve the serious difficulty experienced at times with practically every commercial installation, particularly flooded type systems, viz., an overloaded motor condition due to high back pressures which are beyond the capacity of the motor to handle continuously without dangerous overloads.

Conditions of this kind are indicated by abnormally high head pressures, frequency of cycling, blown fuses, or burned out motors.

Sudden refrigerating loads impose unusually difficult situations which force the motor and condenser to handle more work than can reasonably be expected of them.

The suction pressure throttling valve is simple in design and its operation is easily understood. When a refrigerating compressor completes its cycle of operation and shuts down, the suction pressure gradually increases in the evaporator, suction line and the compressor crankcase. After this shut down period, a very high back pressure may be built up and especially in flooded types of units. This high back pressure may persist for a length of time which taxes the motor beyond its capacity, and causes a loss of refrigeration due to short cycling caused by excessively high head pressures operating on the high pressure cut-out device. This is particularly true after defrosting a multiple installation where low side floats are used. In many cases, the service man is called upon to stand by the suction shut-off valve and restrict the flow of suction gas returning to the compressor by partially closing the suction shut-off valve, and then gradually opening the valve until the high suction pressure gas is reduced and the motor can safely handle the normal load.

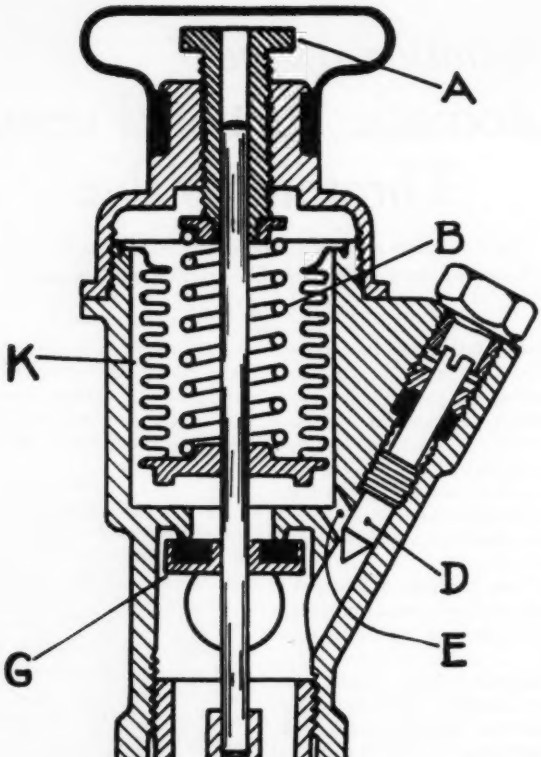
Construction

As an example, refer to the sectional drawing of the American Injector suction pressure throttling valve and note that the suction inlet to the valve is in the bellows chamber and above the valve member itself and the suction gas which surrounds the adjustable spring loaded bellows builds up sufficient pressure during the idle period to close the valve against any passage of gas to the crankcase, were it not for the small adjustable by-pass valve *D* and orifice *E* that makes a variable-sized passage way for the suction gas around the large valve *G* and in turn permits a balanced pressure on both sides of the choke valve.

Operation

When the compressor starts up, the motor can easily and quickly, without overload, relieve the gas pressure in the crankcase, and the small adjustable by-pass valve permits gas from the evaporator to enter the crankcase, but not in sufficient volume to build up an excessive load on the motor. The pumping continues until the suction gas pressure in the evaporator has been reduced through the orifice in the small by-pass valve, until it reaches a pressure previously determined (as less than peak load for the motor) and adjusted by the spring loading screw *A* so that when this previously set pressure in the evaporator has been reached, the adjustable spring *B* overbalances the

* Chief Engineer, Riley Engineering Corp.



AUTOMATIC SUCTION PRESSURE THROTTLING VALVE.

gas pressure, the large valve then opens and normal operating pressures are again resumed. The bellows *K* is open to the atmosphere and the opening of the large valve is adjusted by the adjusting screw so that this large valve will not open until the predetermined maximum motor load conditions have been reached. The valve will then open as the adjusting spring has been given the correct amount of compression to permit it to open when the suction pressure conditions are such that the motor can handle the load continuously without overloading.

The capacity of the motor to handle suction pressures determines the adjustment of the by-pass valve. This cannot be determined in advance but will depend on condenser capacity and several other conditions which must be given consideration.

The suction pressure throttling valve is very low cost insurance against motor overloads and a possible shut-down of the plant at a peak season.

Adjusting of the Valve

The logical place to install the valve is at, or near, the suction port of the compressor where the low pressure gauge is easily read.

It must be remembered that if the low pressure control switch is installed between the compressor and the choke valve, the

switch must be set to cut out at a pressure below that of the throttling valve setting or the switch will cut out before the back pressure in the evaporator is reduced, as the crankcase pressure is reduced almost instantly.

Should the low pressure control switch be installed ahead of the throttling valve; that is, in the suction line between the evaporator and the throttling valve, disregard the setting of the valve in this instance as the suction pressure drop will be gradual, depending on the by-pass opening and the capacity of the unit to handle its maximum load.

Changing a Frigidaire Domestic Unit from F12 to SO_2

The Advisability of Changing the Frigidaire Unit. Operations Necessary in Converting Unit.

By CLARKE FORMAN *

WE know from servicing machines using F12 that it is very difficult to hold the gas, leaks being mainly at the seal. When these machines first came out, the factory advised lapping in a new seal; a short time later a heater element was recommended, and this installed in a fitting which replaced the oil drain plug and hooked in series with the switch, all of which did not prove very satisfactory. By this time, it had reached the point where something had to be done—so a change to SO_2 proved the only solution.

Then the question arose among those not very familiar with the Frigidaire products, how am I to know which machines have F12 in them? The compressor is painted grey; also, there is a metal tag on the cabinet and one on the compressor frame by the serial number. Also, the serial number will be: FAAS-116, FAAS-120, or FAAS-125. These are very important in making this change, as regards the amount of SO_2 needed for each particular unit.

How am I to know when a change is needed? If there is any F12 left in the job, there will be a hissing indicating a shortage at the coil. If the job has thoroughly discharged, switch will not cut in. If partially short, the running cycle will be very long. If not continuous, off cycle will be very short.

This change I am endeavoring to give was the one recommended by the Frigidaire Corporation while I was an employee. I have made quite a number of changes which have proved very satisfactory. I believe the best way for the independent service company to do this job is to pull the complete compressor unit or high side end coil, and take it to the shop, to really ascertain what the job is worth. We did it back in those days right on the job, but that was while in guarantee.

Since there are no shut-off valves on coil, to pull the compressor unit, it will be necessary to shut off liquid valve at receiver and run compressor for about 30 minutes to thoroughly evacuate coil. To hurry this operation, pour hot water over coil and this will enable you to get most of gas out of coil.

Making the Change

The float valve will need to be reseated, as usually they have worked with a shortage of refrigerant so long that they will be damaged. After job is completed and started and the float valve leaks, it will be necessary to change it, so do it immediately and save trouble and time.

* From paper presented at Chicago Chapter R.S.E.S.

The next operation is to discharge receiver. This can be done in the open as the gas is a non-irritant and non-flammable, or it can be done by heating receiver, discharging into drum to be used at some later date. After this has ben done, shut off discharge valve at head of compressor by turning all the way to the right. Now take off discharge cap. Turn a quarter inch line from valve on receiver to suction valve of compressor, either using a $\frac{3}{8}$"x$\frac{1}{4}$" adapter or by turning valve all the way to right. Connect this line to the tee connection in this valve. Open liquid valve and run compressor 30 minutes. This will pull a vacuum all the way from beginning of condenser through complete low side, thereby pumping any gas that might be left in condenser, receiver, or compressor. To my knowledge, there has never been any chemical reaction between the two.

Since this job has run for several years, it will be well to have the seat on the shaft ground; also to lap the seat of the seal to be sure it is in good condition. This is a weakness of using F12. The machines will hold SO_2 but F12 will leak out.

Changing Setting of Switch

On F12, the switch setting is 25 pounds cut-in and 16 pounds cut-out; so to use the switch for SO_2, the switch settings will be 9 in. cut-out and 5 pounds cut-in. The following change is required: In the center of the switch, there is the adjusting screw which runs through and extends below the switch base. On the bottom of this are two locknuts, spring, and a Bakelite bushing. Take these off, and discard the spring and two locknuts, as they are not needed. Take out the small pin that holds this adjusting screw to the sylphon arm and remove adjusting screw. Then the Bakelite bushing removed from below is put under the top spring of adjusting screw end reassembled.

We know that more SO_2 needs to be compressed than F12, so, in order to accomplish this, we must speed up the job, putting on a larger pulley: Frigidaire No. 85816, which is 3$\frac{5}{8}$" diameter, and a longer belt; Frigidaire No. 621445, which is a 45$\frac{1}{4}$x21$\frac{1}{32}$, Charter No. 4x09 or Gilmer No. 5784. It is well to mention at this point that the stroke of an SO_2 compressor used on these jobs is 1$\frac{7}{16}$", bore 1$\frac{1}{2}$", while on F12 the stroke is 1", bore 1$\frac{1}{2}$".

Charging the Unit with SO_2

In an FAAS-116 compressor in the 3 and 4 cubic foot boxes with the 112 TF coil which is two tray, one-half pound of 150 viscosity oil in coil; 1$\frac{1}{2}$ pound in compressor; 4$\frac{1}{2}$ pounds SO_2. This is complete charge. In the FAAS-120 compressor which has a No. 117TF, which is a three tray coil, the oil charge is three-quarter pound of 150 viscosity oil, compressor 1$\frac{1}{2}$ pound, and the SO_2 charge is 5$\frac{1}{2}$ pounds. If this charge is made on the job, just add one-half pound of 150V oil and SO_2 charge as mentioned before.

Now to Reassemble Job

Purge lines and set switch at 9 in. and 5 pounds. It may have a tendency to run too cold for a day or so until job has time to settle down on its correct cycle. Remove the F12 metal plates on compressor and cabinet and paint lower half of compressor black which designates the change has been made.

Summing Up

It is not a very long or hard job to make this change. Remember the SO_2 charge, the change of switch, and adjusting; also, change of belt and pulley, and adding oil.

On the FAAS-125, which is the 6 cubic foot box and over, the following parts are necessary to increase the efficiency of the compressor. The parts give the compressor a little longer stroke; just how much I do not know. Frigidaire part numbers are given: Two No. 89522 piston assembly, two No. 622090 connecting rods, one No. 621413 eccentric. On the 6 cubic ft. the SO_2 charge is 6$\frac{1}{2}$ pounds. On the 8 cubic ft. and 10 cubic ft. the SO_2 charge is 10 pounds. The oil charge of these is three-quarter pound in coil, 1$\frac{1}{2}$ pound in compressor. 150 viscosity oil is used in all these jobs.

Lubrication of Air-Conditioning Equipment

The Following General Considerations on the Proper Lubrication of Air Conditioning Equipment, Are from "Lubrication" Published by the Texas Co.

STUDY of the lubrication of refrigeration machinery as applied to air-conditioning operations has been actively extended over recent years with the markedly increased popularity of comfort cooling. It has been particularly accelerated by the necessity for lubricating oils employed in compressor service to function dependably over extended periods of time, and under a wide variety of operating conditions. The function of the compressor is especially important, as it must recover the refrigerant or cooling agent after the latter has been evaporated in the cooling side of the system, and then bring it into such a form as to render it again capable of cooling. This cycle must be continuous and positive.

Advances in the study of compressor design, in turn, have led to the adoption of two distinct types of compressors, viz.:

(1) The reciprocating machine, either single or double acting, of one or more cylinders, according to the size of the job and the amount of refrigeration required, and (2) the centrifugal compressor. This latter is unique by reason of the constant pressures available, and the comparative simplicity of its lubricating system.

In part, this trend in design has been due to the higher loads which must be carried, space limitations, and the physical properties of a group of refrigerating chemicals which have proved especially adaptable to air-conditioning service. Compressor operations under these conditions impose a definite load upon the lubricant which must be fully anticipated before any such machine is put into service. Otherwise difficulty may result, especially if the oil is not suited to the operating requirements, or to the physico-chemical nature of the refrigerant.

Types of Installations

Air-conditioning installations as they are being planned today may be broadly divided into two classifications, viz.:

The Centralized, and
The Unit Type.

Centralized installations are normally designed to serve an extensive amount of space such as would be involved in theatres, restaurants, clubs, hospitals, office buildings and public halls. From one to an extensive number of rooms can be conditioned by such a system, dependent upon the feasibility of installing the necessary ducts for air circulation. The compactness of the compressor and other machinery renders location a very flexible matter, from a corner of the powerplant or basement to any available space regardless of floor level.

Unit air-conditioning, in turn, is generally applicable to homes, individual office rooms, dining cars and other railway equipment. Normally a unit installation involves a complete compressor and refrigerating system for each room or compartment to be served.

The centrifugal type of compressor has been widely adapted to central station applications along with the more conventional type of multi-cylinder reciprocating machine.

Miscibility with Lubricating Oils

Certain refrigerants are completely miscible with petroleum lubricating oils. In air-conditioning service we are particularly concerned with Freon, Carrene and methyl chloride, although there are a considerable number of other refrigerants of chlorinated hydro-carbon nature, or the halo-fluoro derivatives of aliphatic hydro-carbons which must also be considered.

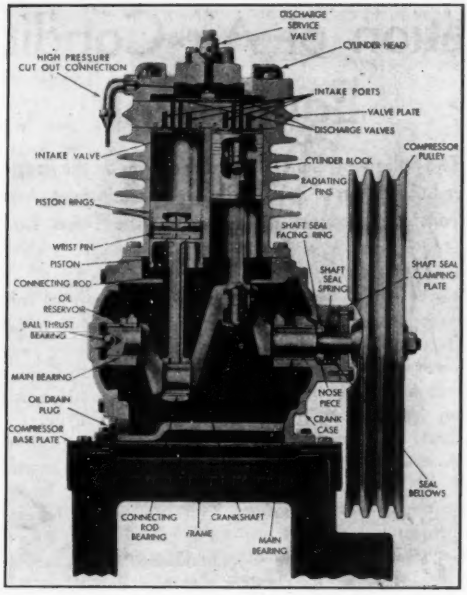


Fig. 1—Sectional view of the General Electric CM Compressor, showing details of construction. Note in particular bearing design and relative location of lubrication elements.

The extent to which the compressor oil in an air-conditioning system may come into appreciable contact with the refrigerant will depend upon the type of compressor. The centrifugal machine presents a comparatively simple problem involving the lubrication of ring-oiled bearings and the maintenance of a seal against loss of vacuum. Normally, a certain amount of leakage of the refrigerant, which is generally Carrene (dichloromethane), will occur; it will not be sufficiently extensive, however, to give any concern as to the resultant lubricating ability of an oil which has been specifically refined for this class of service.

In the reciprocating installation the question of the method of lubrication enters into the problem. Small tonnage units designed for splash lubrication, as are so many of the vertical unit type railway or household machines, depend upon oil thrown from the crank to splash the necessary amount of oil to the cylinders and bearings. Where there is possibility of some of this oil passing over to the high pressure side to become mixed with the refrigerant, there is provision for return directly to the crankcase. In such machines an oil level regulating device is therefore frequently installed, although if care is observed not to charge the compressor with too much oil to begin with, oil level regulation may not be necessary; it is therefore not always used on the small unit type of machine. In other designs oil is returned to the condensing unit by the velocity of the refrigerant vapor.

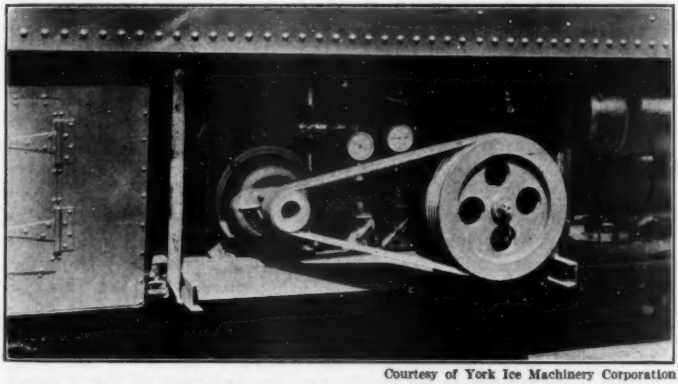
The reciprocating compressor can also be built so that the refrigerant vapors are kept entirely apart from the crankcase. In such machines the possibility of mixture with oil, at least at this point, is largely eliminated. This enables the oil to maintain its original viscosity, or merely to follow the normal reduction in viscosity which would take place as the crankcase comes up to average operating temperature. This condition will prevail in the enclosed crankcase machine equipped with trunk-type pistons and de-

Courtesy of Westinghouse Electric and Manufacturing Company

Fig. 2—Detailed view of a Westinghouse compressor designed for air conditioning service, showing oil level in the crankcase and means of circulation. Note in particular the location of the oil separator and oil return to the crankcase.

signed for pressure lubrication. The oil pump maintains positive circulation of oil without excessive splash effect; therefore, foaming is markedly decreased. Reduction of oil splash in turn reduces the tendency of any refrigerant present to mix with the oil supply, especially as there is no circulation of refrigerant vapors within the crankcase. Location of the oil pump in such a machine must of course be carefully studied. Some authorities recommend that it be at the lowest point in the case to insure against loss of suction and the resultant reduction in volume of oil circulated which might readily lead to impaired lubrication; others feel that a settling chamber below the pump is an advantage.

The cross head type of vertical compressor, as well as the horizontal double-seal stuffing box machine, are also adaptable to large tonnage central station air-conditioning service. In these units the refrigerant



Courtesy of York Ice Machinery Corporation

Fig. 3—The York railroad type Freon compressor and motor with V-belt drive and special mounting for installation under a passenger car.

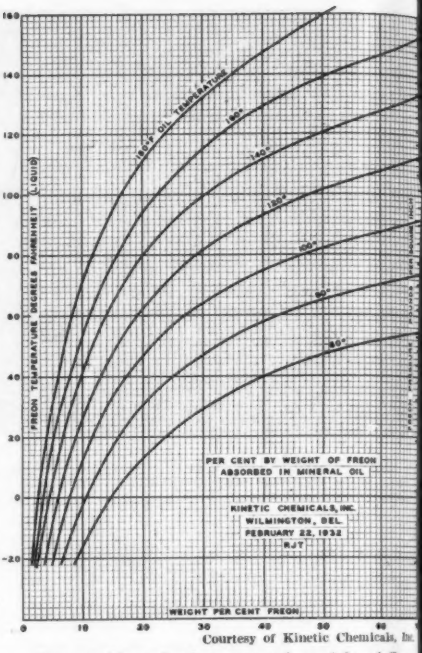
vapors are also kept out of the base or crankcase of the machine; instead they are returned directly to the cylinder block. As a result there is no possibility of the oil in the case becoming mixed with refrigerant, so here again foaming, especially with Freon, is eliminated along with reduction in viscosity. Since lubrication of the crankcase elements or external parts is maintained entirely independent from the cylinders, it is customary to provide for injection of a certain amount of oil into the refrigerant return line or directly to the cylinder and stuffing boxes to take care of piston and valve lubrication and protection of the cylinder walls against scoring.

Factors Governing Absorption of Freon by Lubricating Oil

Apart from mechanical and constructional conditions, the amount of Freon which may be absorbed by any mineral oil will be dependent upon the viscosity of the oil at the temperature of contact and the pour test of this oil; pressure also becomes a factor. In other words, larger amounts of Freon are absorbed by mineral oils at higher pressures and lower temperatures, just as smaller amounts of this refrigerant will be absorbed at lower pressures and higher temperatures. In addition, lower viscosity oils absorb less Freon for a given weight than will lubricants of higher viscosity.

Lubricating Oil Requirements
Viscosity Range

This matter of mixture of petroleum lubricating oils with refrigerants of halogen combinations must of course influence the original selection of such lubricants from the viewpoint of viscosity. In other words, when dealing with lubrication of a compressor charged with Freon or methyl chloride, an oil of somewhat higher original viscosity must be used than would be necessary were the refrigerant to be non-miscible with such an oil. Theoretically, a wide range of operating and constructional conditions exist which should be given careful consideration. Unfortunately, however, these may occur in such a variety of combinations as to render it necessary to adopt a broad grouping of oil characteristics contingent upon the most influential factors such as speed, intake and

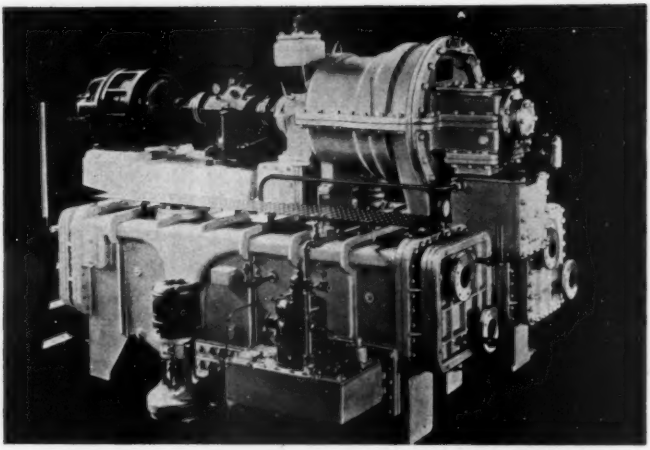


Courtesy of Kinetic Chemicals, Inc.

Fig. 5—Chart showing percent by weight of Freon absorbed in mineral oil for various temperatures and pressures.

discharge temperatures, means of cooling and the method of application of the oil.

For example: in a small capacity enclosed type slow-speed machine operating from an evaporator temperature around zero degrees Fahrenheit, an oil of from 150 to 300 seconds Saybolt Viscosity at 100 degrees F. will be advisable, the higher viscosity range being approached in accordance with positive information as to the normal content of refrigerant. Some interesting test data have been developed to indicate that this will be from 10 to 12 percent in average service. To realize the extent to which this will reduce the viscosity of a 300 viscosity oil, one should refer to the accompanying charts. In brief, using an oil of this viscosity in an enclosed reciprocating machine operating at 130 degrees F. crankcase temperature and 40 pounds suction pressure, reference to Fig. 5 shows a normal Freon content of approximately 11 per-



Courtesy of Carrier Engineering Corporation

Fig. 4—Showing a typical Carrier centrifugal type refrigerating compressor as adapted to central station air conditioning operations.

cent. Subsequent reference to Fig. 6 indicates that with such a Freon content the atmospheric viscosity of the mixture at 100 degrees F., will be around 70 seconds Saybolt.

As one approaches higher speed, load or

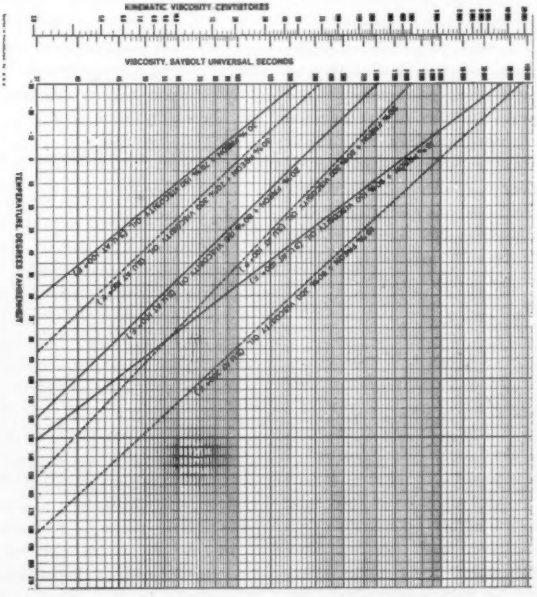
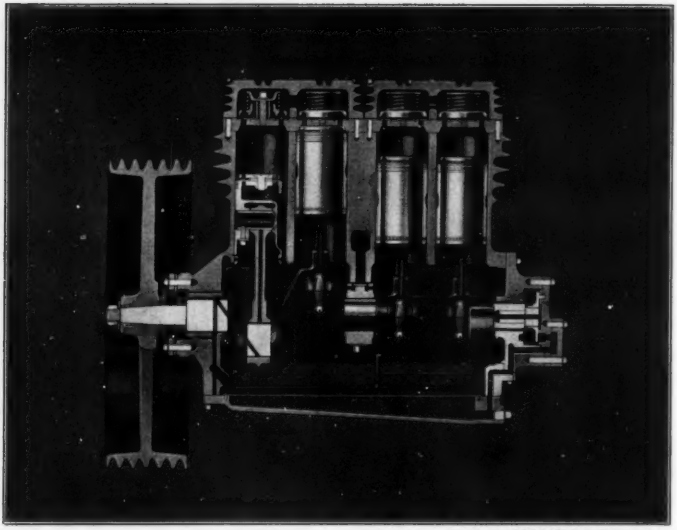


Fig. 6—Viscosity Temperature Chart showing viscosity curves for oils of 150 and 300 seconds, Saybolt Universal Viscosity, at 100 degrees F., when diluted with 10, 20 and 30 percent of Freon.



Courtesy of Frigidaire Corporation

Fig. 7—Showing a cut-away view of the Frigidaire 4 cylinder air conditioning compressor. All parts of this machine are designed for very accurate precision and lubrication is entirely automatic.

tonnage conditions, however, such as might prevail in the central station installation or on the relatively high-speed railway compressor, an increase in viscosity is deemed advisable, with proportionately less stress being attached to the pour test of the oil due to the higher operating temperature range. In such installations the oil viscosity may have to range from 300 to 900 seconds Saybolt at 100 degrees F., according to type and capacity of the compressor.

Flash Point

While the average air-conditioning compressor will function at maximum temperatures considerably below 200 degrees F., there will be times when an installation of the booster type may approach 250 degrees F., on the discharge side. For this reason the flash point, as an indication of the relative vaporizing tendency of petroleum lubricating oil, must be given consideration. Fortunately, the flash point of even the lower viscosity oils will be sufficiently above 350 degrees F., to preclude any abnormal vaporization and thickening of the oil.

A further indication of the degree of refinements is the extremely low tendency to form carbon residue on heating, which will be shown by such oils.

Corrosion and Resistance to Breakdown

The tendency which any petroleum lubricating oil will have to bring about the above reactions will be more or less a measure of the method of refinement. In the interest of reducing the corrosion tendency, it is especially essential that the water content be practically nil; this is also necessary to prevent freezing at the regulating valve and possible restriction of flow of refrigerant. Water would also freeze in the cooling coils, to reduce evaporative efficiency. A dehydrated oil is also advisable to prevent possible chemical dissociation of Freon, which might lead to serious damage to the machine parts through acid formation.

The results which may accrue from chemical breakdown of the oil itself will be very disturbing in the average air-conditioning installation regardless of the type of refrigerant used, for it will lead to gum forma-

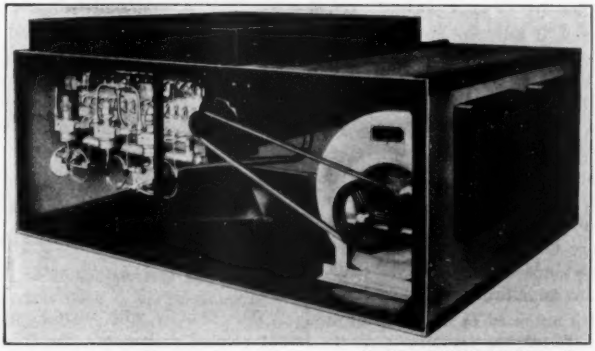
tion and actual stopping of the unit. Resistance to breakdown is determined by the petroleum chemist in terms of resistance to oxidation. A variety of interesting tests have been developed to enable accurate prediction of this tendency and to guide him in development of refinery methods which will effectively remove those hydro-carbon constituents which may be unstable and thereby most readily susceptible to chemical dissociation. It is this latter which is regarded as being the basic cause of gum formation, and deposition of residual matter around piston rings, or in bearing oil grooves. Its formation is materially accelerated by heat in the presence of moisture, or by the solvent action of certain chemicals.

Physical Effects of Temperature

The effect of cold upon petroleum lubricating oils is not the same as upon simple fluids such as water, alcohol, glycerine, etc. Such products have fixed and accurately ascertainable freezing points at which a complete change from the liquid to the solid phase takes place. Lubricating oils, however, which are complex mixtures of hydrocarbons of various melting points or freezing points, behave like solutions and frequently deposit some portion of their constituents before the whole mixture solidifies.

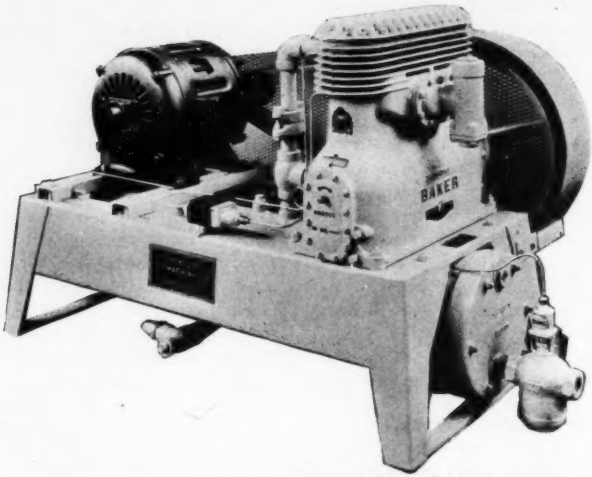
This fact must be thoroughly recognized when specifying and refining such oils for air-conditioning compressor lubrication, in conjunction of course with the minimum operating temperatures to which any such oil may be subjected. Fortunately, in average air-conditioning service, these temperatures will not be as low as in some types of refrigeration work. They will, however, be sufficiently extreme to render the pour test one of the principal characteristics to be investigated in a study of lubricating oils for such service.

The varied behavior of certain types of petroleum oils when subjected to low temperature conditions has led to exhaustive study of methods of test, to determine accurately when congealment begins and fluidity becomes retarded. Where we are concerned with lubrication of compressors applied to air-conditioning installations, this knowledge becomes of considerable value in the initial selection of lubricating oils which will possess adequate fluidity to enable ready handling by the conventional types of oil-circulating systems, and maintain protective lubrication of the parts to be served. Obviously, the oil must also remain comparatively fluid at the lowest temperatures to which it may be subjected during operation. These temperatures will usually be encountered in the expansion or refrigerating side of the system after the refrigerant has passed the expansion valve. Should the refrigerant be carrying a high percentage of oil at this point, any tendency towards wax congealment might lead to faulty operation of this valve or insufficient heat transfer. The pour test is indicative of the extent to



Courtesy of Kelvinator Corporation

Fig. 8—A Kelvinator air conditioning unit of the suspended type with side panel removed to show the interior.



Courtesy of Baker Ice Machine Co., Inc.

Fig. 9—The Baker 4 cylinder, vertical, reciprocating, single acting air conditioning compressor. Timken roller bearings are used on both the drive and blind end. Crankshaft and connecting rod bearings, as well as piston pins, are under full force feed lubrication which is maintained by a built-in positive drive, high pressure gear type oil pump.

which this may be expected. In the terms of the American Society for Testing Materials—"the pour point of a petroleum oil is the lowest temperature at which the oil will pour or flow when it is chilled, without disturbance under definitely prescribed conditions."

The proviso in regard to disturbance is especially important. Extensive research has developed that any agitation or stirring of the oil while cooling in a pour test determination is contrary to good practice. When an oil is stirred, it solidifies at a lower temperature than when held absolutely motionless. This is explained by the assumption that the movement of the oil destroys the formation of a fine network of microscopic particles of paraffinic bodies in the course of separation. This segregation is regarded as giving the oil a certain amount of support, to thereby facilitate solidification. The test procedure should, therefore, provide for absolutely motionless cooling.

Continued in the November Issue. Additional Data and Illustrations will be printed.

SUBSTITUTE BRINE SOLUTION

THE use of brine solution in refrigeration cabinets has always given trouble because of the corrosive action of the brine solution. There have been many substitutes for brine solution put out on the market.

One of the substitute solutions used is a mixture of alcohol and water. The following table will give the percentages of alcohol necessary to arrive at various freezing points:

% by Weight of Alcohol	Freezing Point Deg. Fahr.	% by Weight of Alcohol	Freezing Point Deg. Fahr.
2.58	30.2	21.7	10.4
5.22	28.4	23.8	6.8
7.36	26.6	26.0	3.2
9.58	24.8	28.0	— 0.4
11.50	23.0	30.0	— 4.0
13.27	21.2	33.5	—11.2
16.53	17.6	37.3	—18.4
19.09	14.0	41.2	—25.6

The trouble with such a solution is that as alcohol evaporates, the freezing point is changed. It is necessary, therefore, to use this solution in a securely covered container.

THE Question BOX

Readers are invited to send their problems pertaining to the servicing of household refrigerators and small commercial refrigerating equipment as well as oil burners to "The Question Box" which will be answered by competent authorities.

THE following questions submitted to this department are answered by Mr. George H. Clark, chairman National Educational and Examining Board, Refrigeration Service Engineers Society.

Have any readers other opinions regarding the problems involved. Send them to the Editor.

CORRECTION TO QUESTION 88

IN the answer to this question appearing in the September issue, it is stated that the heat transfer is approximately 2 B.t.u.'s per square foot of tube surface per degree difference in temperature between refrigerant and air temperature per hour. This should read as follows:

For ¼ inch, ⅜ inch and ½ inch copper tubing, the square feet of area is figured and multiplied by the difference in temperature and is not multiplied by the 2 B.t.u.'s per square foot per degree per hour. Consequently, the answer given for the heat transfer for ½ inch tubing per 100 square feet is 471 B.t.u.'s per hour. It should be twice this amount or 942 B.t.u.'s per hour.

That will also affect the I.M.E. for 24 hours, making it twice as much as that stated in the answer given.

ADDING FREON

Question 93. Which is the best way to add Freon to a system both in large quantities and small quantities? Where is the best location for an expansion bulb that is to be used on a coil which is placed in a bath or submerged in a liquid? Is it best for the bulb to be out of the bath or in the bath, say an inch or two from top of liquid level?

If it is better to be out of the bath the reason would be that the power element of the expansion valve is not sensitive enough for the small change of temperature of the bath. If it is clamped to suction line above the liquid level of the bath the change of temperature of the suction is greater than the change in temperature of the bath. When I stated above as to the bulb being out of the bath it is meant to be clamped to suction line. Why will not a double suction line become oil bound as easily as a single suction line? Can't oil accumulate in both as well as one? I know the total clearance volume of both would be more than one suction line.

ANSWER: In small quantities Freon may be added to a system by drawing it in the suction side of the compressor. By this method the frost line on the drum may be observed and a rough idea of the quantity put in may be obtained. Where it is desired to put a complete container-full or the complete contents of a container it is usually quicker to put it in the compressor head by heating the container to a temperature above that of the receiver on the machine. In putting the refrigerant in the suction side the drum may be warmed by keeping it in a bath of water and stirring the water. In putting the refrigerant in the head of the compressor the drum may be heated by putting under a hot water tap, making very sure that the drum is not too full of refrigerant as the liquid expansion might cause an unlimited pressure and blow up the cylinder if there is no vapor space left in the drum. In some cases the drum may be heated by pumping the high pressure vapor from the head of the compressor directly into the drum. In this case also it is necessary to be sure that there is plenty of vapor space in the drum.

To get best results from the thermostatic expansion valve the bulb should be clamped to the suction line just below the water level. This will allow the full coil to refrigerate, will insure against a frost back or flood back and will also assure that no short cycling will result due to liquid feeding through during shut down period.

A double suction line will become oil bound as easily as one and perhaps one line is more apt to become oil bound in the case of two lines than one is. The advantage in two suction lines is to cut down the drop in pressure from the evaporator to the compressor due to friction losses which depend largely on the velocity of gases through the tube. If two separate evaporators are used in a cooler a suction line for each coil will be of some assistance in keeping both coils working.

INSTALLATION PROBLEMS

QUESTION 94. *Would like to have some information regarding two different installations.*

(A) The first job consists of: 1½ hp. Frigidaire with a kitchen box of thirty cubic feet, very near a large restaurant range; another smaller box of about ten cubic feet, in the next room, for fruits, etc.; then another box of the same capacity for milk, bottled goods, etc. There is also a water tank holding 60 gallons of calcium brine with a 50 foot ½ inch copper pipe that I bent to shape and put it in myself to replace a worn out ½ inch galvanized pipe coil that was also 50 feet long. I have set the control on this machine to a 9 inch vacuum and a 4 lb. back pressure (SO_2). The ice boxes get too cold, sometimes the water is warm and at other times it is cold enough, but the machine runs all the time and will not cycle. The customer serves about two hundred people per day, which will give you an idea of the water consumption. Water inlet 85 degrees; desired outlet about 50 degrees. I believe that a two-temperature valve between the water and the other boxes with check valves on each line would solve this difficulty. However, he insists that it worked all right when installed, and can not see why it should have these other parts. This is an air-cooled machine and it sits under the stairway in a small room and develops a high head pressure. An electric fan, set near the condenser, lowered the head pressure 15 lbs.

(B) The other job is a ½ hp. Kelvinator water-cooled job with a 4½ pulley and a 1 hp. motor on it. It has a 4 hole ice cream cabinet on it, a Fedders beer coil, (18.0 gallons per hour), and a Frigidaire fin coil in a flat type bottle cooler, that holds about three cases of pop on one side of the coil. On the other side it has about a twenty-five foot water coil with just enough water in it to cover the coil, then over that it has a shelf for milk and butter—plain metal cover, no insulation. This has an old type Frigidaire valve between the ice cream cabinet and the beer coil and milk and bottle cooler. The machine seems to run all the time; if not the beer gets too warm. In the meantime, the ice cream is too hard. The milk cooler seems to be all right, although the coil does not frost. It seems to maintain a cold sweat just above the freezing point. The valve between the coils on this installation does not seem to function very well and acts more like a regular shut-off valve of the bellows type. I have noticed at times this machine will short cycle very rapidly, though it seems to hold a temperature. Have checked this for water flow and SO_2 and they show O. K. These two jobs have been a headache to me and a little intelligent advice will be appreciated.

ANSWER: (A) From your statement of your service problem, I would say that the condensing unit should have plenty of capacity for the load which it has on it unless the room in which the condensing unit is installed is extremely hot and the machine operates at head pressures of over 150 lbs. per square inch; and, even with extreme head pressures, the machine should take care of the job in good shape. The fan near the condenser should, of course, be of considerable help.

I should suspect that there may be something wrong in the quantity of refrigerant in the machine or more probably in the compressor itself. I would suggest checking the compressor valves. This is undoubtedly a two-cylinder machine and it may be that one cylinder is working properly, while the other cylinder is not working at all. If a piston valve is not opening properly or is leaking badly, it is quite possible to draw a good vacuum with the compressor and pump a high pressure with the compressor on the one good cylinder, so that no indication can be determined by your pressures.

One indication of a compressor working on one cylinder alone may be had by noticing the fluctuations in the head pressure gauge. In a twin-cylinder compressor, if the gauge fluctuates only once for each revolution of the compressor, it is an indication that only one cylinder is working.

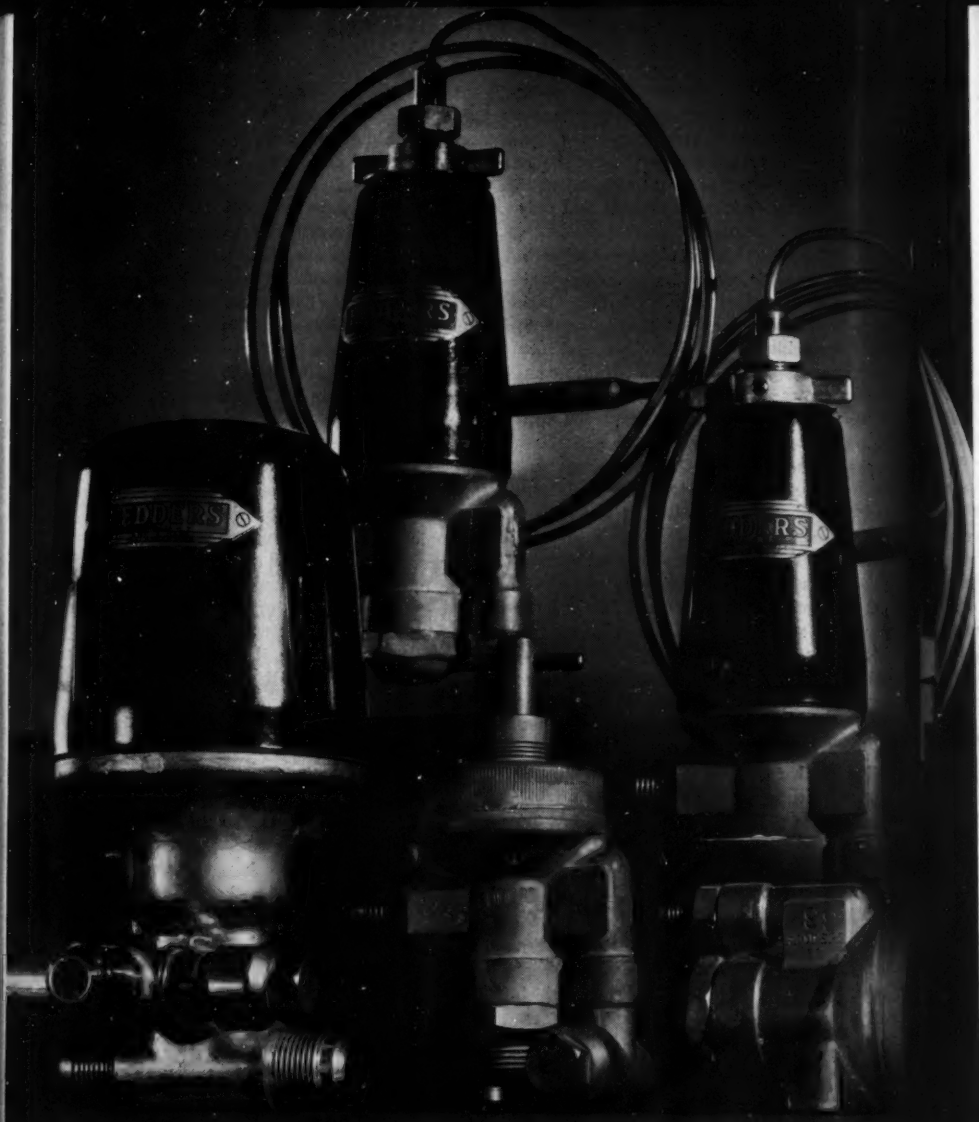
The head valves should also be checked to be sure that the gas is not leaking back through a defective valve. Another quick check for piston valves and head valves is to stop the machine, take off the belts and turn the compressor over by hand. If the compressor comes up against a pressure on one piston for the full length of the stroke until it goes to the top of the cylinder and starts on the down stroke and the wheel then spins around for another half turn when released, this is an absolute indication of a very bad head valve in one cylinder. If both head valves are bad, of course the machine will not act this way; but in this case you would probably get no refrigeration. If the head valves are all right, the piston valve may be checked by turning the compressor by hand and noting if it comes up against compression when the piston is near the top of the stroke and if, when it gets beyond the top of the stroke, it again turns freely, it is an indication that one piston valve at least is all right; if you get two pressure strokes per revolution of the fly wheel, it is an indication that both piston valves are all right.

Another thing which may cause the machine to run continuously with insufficient refrigeration may be shortage of refrigerant, partially plugged lines or valves or a defective receiver which allows vapor to go through the liquid line with the liquid, which will thereby cut down the quantity of refrigeration.

(B) From your statement of your problem, I gather that you have a Frigidaire temperating valve connected to the suction line which comes from the flat coil in the bottle cooler and the beer coil, while the ice cream cabinet is connected directly to the main suction line. I would say that in this particular case you may need a somewhat higher setting of your pressure control in order to keep your ice cream from getting too hard; at least the cut-out pressure should not be as low as at present. The temperating valve may be installed in connection with the beer cooler to prevent freezing, and in this case, the milk cooler would not freeze when connected to the same valve; and, the water coil, if connected into the same line, would not freeze any ice on the coil, which I would think might not provide water of low enough temperature.

I would suggest that another temperating valve be installed in connection with your water coil and these two temperating valves might then be adjusted in order to get the desired conditions in the beer coil and in the water coil. The chief difficulty in connection with the use of temperating valves is that the valve will meter the refrigerant through as evaporation takes place and this is inclined to raise the suction pressure in the main suction line and will cause short cycling. The only good way to eliminate this condition that I know of is to install a low pressure accumulator tank in connection with the main suction line so that while the machine is operating, the pressure in this tank will be reduced to the cut-out pressure used for the ice cream cabinet. While the machine is not operating, some refrigeration may be accomplished in the beer coil and water coil before the pressure in the accumulator tank is raised to the ice cream cabinet cut-in pressure, and this will tend to make the cycles somewhat longer, although they may still be short compared to a system which does not make use of temperating valves.

I would say further that on this machine where you are running 18 gallons of beer per hour in addition to your water and your ice cream cabinet, you have a very good load on the machine. The beer coil alone, if cooling the beer through a temperature of only ten degrees, would require approximately 200 I.M.E. for 24 hours, which would be very nearly half the capacity of a ½ hp. water-cooled machine. You probably have some extra capacity in the larger size motor and pulley. However, this machine undoubtedly has a good load on it under hot weather conditions. Not being on the job personally makes it hard to give any more definite information than this.



FEDDERS QUALITY VAL'S

Illustrated above—Fedders Two-Temperature Snap Action Valve, Constant Pressure Valve, Automatic Expansion Valve, [illegible] High Capacity Thermostatic Expansion Valve, Model 33 Thermostatic Expansion Valve, Check Valve. Patented and Pat[illegible]

FEDDERS MANUFA[U]

SATISFACTION
based on Quality has made
FEDDERS
THE
BUY-WORD

ALL OVER THE MAP

BALTIMORE, MD.
Melchior, Armstrong, Dessau Co.

BOSTON, (CAMBRIDGE), MASS.
Melchior, Armstrong, Dessau Co.

BRIDGEPORT, CONN.
Parsons Bros.

BUFFALO, N. Y.
Fedders Manufacturing Co.
Beals, McCarthy & Rogers
Root-Neal & Co.

CHICAGO, ILL.
Fedders Manufacturing Co.
Harry Alter Supply Co.
H. W. Blythe Co.
Borg-Warner Service Parts Co.
George Monjian Co.
The Airo Supply Co.

CINCINNATI, OHIO
Fedders Manufacturing Co.
Merkel Brothers Co.

CLEVELAND, OHIO
Debes & Company

DALLAS, TEXAS
Fedders Manufacturing Co.
Beckett Electric Co.

DENVER, COLO.
Auto Equipment Company

DETROIT, MICH.
W. C. DuComb Company

FERNWOOD, MISS.
Enochs Sales Company

GREENSBORO, N. C.
Home Appliance Service Co.

HOUSTON, TEXAS
Walter Refrigeration Supply Co.
D. C. Lingo Company

INDIANAPOLIS, IND.
Langsenkamp Company

KANSAS CITY, MO.
Natkin & Company

LONG BEACH, CALIF.
Allied Refrigeration

LOS ANGELES, CALIF.
Fedders Manufacturing Co.
National Refrigeration Products Co.
Franklin G. Slagel

LOUISVILLE, KY.
Geo. Dehler, Jr. & Co.

MEMPHIS, TENN.
Lewis Supply Co.

MINNEAPOLIS, MINN.
Refrigeration & Industrial Supply Co.

NEW ORLEANS, LA.
Enoch Sales Co.

NEW YORK CITY
Fedders Manufacturing Co.
Melchior, Armstrong, Dessau Co.
Aetna Supply Co.
Wholesale Radio Service Co.

PHILADELPHIA, PA.
Melchior, Armstrong, Dessau Co.

PHOENIX, ARIZ.
R. R. Reynolds Co.

PITTSBURGH, PA.
William M. Orr Co.

PORTLAND, ORE.
Stone Supply Co.
Refrigerative Supply, Inc.
Refrig. & Power Specialties Co.

SAN ANTONIO, TEXAS
Strauss-Frank Co.

SAN FRANCISCO, CALIF.
California Refrigerator Co.
Refrigerator & Power Specialties Co.

SEATTLE, WASH.
Refrigerative Supply, Inc.
Refrigerator & Power Specialties Co.

SPOKANE, WASH.
E. S. Matthews, Inc.
Electric Refrigeration Co.
Refrigeration Parts Supply Co.

ST. LOUIS, MO.
The Spangler Company

VANCOUVER, B. C.
Fleck Bros., Ltd.

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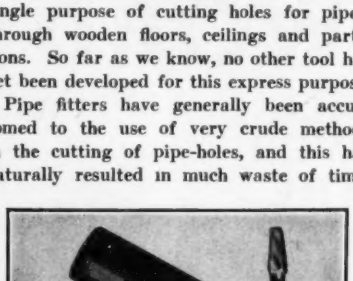
NEW MECHANICAL DEVICES
Service Tools and Special Equipment

Under this heading there will be published illustrated descriptions of new or improved service tools and equipment for the Service Engineer.

ROTARY PIPE-HOLE SAWS

THE rotary pipe-hole saw, which has recently been developed, is made for the single purpose of cutting holes for pipes, through wooden floors, ceilings and partitions. So far as we know, no other tool has yet been developed for this express purpose.

Pipe fitters have generally been accustomed to the use of very crude methods in the cutting of pipe-holes, and this has naturally resulted in much waste of time,



ROTARY PIPE HOLE SAWS.

with consequent high labor cost. It is a fact that often the cutting of a single pipe-hole, with wrong tools and under difficult conditions, may have taken a long time, whereas the use of this tool would have accomplished the same work in a moment's time.

The pipe-hole saw will cut through nails without injury to the tool; also through metal ceilings. This is one of the important features of the tool, for destruction of bits and other edged tools in striking nails has always been a constant source of expense and annoyance in the cutting of pipe-holes with such tools.

Notwithstanding the extreme toughness of these saws, they may be re-sharpened with a file.

The secret of the successful operation of the rotary pipe-hole saws is largely due to the long narrow slots which are to be seen in each cutter. The slots provide an escape for the sawdust as fast as it accumulates. Without this feature, sawdust would pile up on top of the teeth of the cutter and soon stall the saw.

The cutters or saws are made of sufficient depth to go through three thicknesses of flooring, two thicknesses being ordinarily used.

At the present time, pipe-hole saws are being made in five sizes; for ¾-inch, 1-inch, 1¼-inch, 1½-inch and 2-inch pipe, and may be used either in a bit brace by hand, or in an electric drill.

* * *

INSURING PROMPT SERVICE FOR THE REFRIGERATION SERVICE MAN

WITH the rapid expansion in the refrigeration servicing field, one of the problems facing the manufacturer is the distribution of his commodity into the hands of the service man. How best this can be accomplished in view of the fact that during the busy season refrigeration servicing is now a matter of rendering service the same day, it has been interesting to note the method that some distributors of refrigeration accessories have adopted to insure prompt service to the service man.

The Rotary Seal Company has made exceptional progress in this direction, and naturally interested in the manner in which they have provided universal distribution facilities, we interviewed Mr. G. P. Gilman, president, and Mr. Chas. Muller, secretary. In outlining their plan of procedure, they stated in part that, "While our main business always has been the manufacture of mechanical seals for rotating shafts as

standard equipment to manufacturers, several years ago local refrigeration service men came to us with their sealing problems. It became a habit with them to bring their compressors to our factory whenever they were confronted with shaft leaks, for the reason that they preferred our seals and were unable to purchase them elsewhere. They were always so enthusiastic about the performance of our sealing units, it occurred to us that here was an unusual opportunity of serving such men throughout the country, if we could find the means of reaching them. Thus we were faced with the problem of creating a market for our refrigeration replacement units.

"Our first investigation revealed the fact that there were very few refrigeration replacement parts jobbers in the field. We realized it was only natural that the mechanical refrigeration replacement parts industry would parallel to some extent the experience of the automotive industry and that it was necessary at this stage for any manufacturer of replacement parts to pioneer a movement to create interest for the service men first and then prospective jobbers.

"During the past few years, this country has been going through the greatest depression in history. A depressed spirit permeated all business and lack of interest prevailed everywhere. This meant a tremendous impression had to be created at the start to give our sales campaign the proper impetus.

"It is one thing to enter a field with a product already having established jobbers, but quite another to embark on a selling campaign without any jobbers to turn to. Plans were formulated and we first had to go through the elementary stage of direct mail selling to create a demand for our units. This developed very rapidly, so our new task meant a broadening and enlargement of our sphere of activity to expedite deliveries of our product, for everything connected with refrigeration servicing is usually required immediately. Our next aim was to search out prospective jobbers and to point out the big future possibilities awaiting them in this field. Selective sales letters were assiduously employed and certain types of jobbers were approached. Our selling efforts were then aimed at those prospects who had the foresight to realize that a new market was in the stage of development.

"As quickly as we established jobbers in a territory, the service men were notified.

"Jobbers' interest and enthusiasm must be kept alive and active at all times. A manufacturer must give most helpful contributions; advertising literature for distribution, samples, demonstrators, and advertise in trade magazines to reach the user. The main purpose is to serve. A company must interpret itself favorably to those whose good will it needs. The appeal of its products must be concise, refined and thorough, with a plain statement of facts. We have found from experience that the *Refrigeration Service Engineer* is the best medium for reaching the service men, in addition to attracting new jobbers.

"Our replacement units are shown in a favorable light because, in addition to their special merits, they are sold on a policy of giving perfect satisfaction. We realize that in marketing a new product, there will be a certain percentage of service men who are not familiar with it and its proper installation. Due to this, occasionally perfect performance is not obtained. To prevent any discouragement on the part of the service men, we at all times replaced any seals which were returned to us as not being perfectly satisfactory, although most of these failures were due to improper installation and handling which were beyond our control. We have found that the adoption of such a policy resulted in obtaining the good will of the service men, and gradually the percentage of returns was greatly reduced.

"The price situation was met intelligently and a uniform list of discounts was established for the service men and jobbers and we make every effort to maintain them.

"For years the average jobber worked along the line of least resistance, filling orders as they were received. Our jobbers are very active and progressive for, having had the way pointed out to them and realizing the big future in this field, they are now enjoying increased sales and profits.

TESTS ON RECIPROCATING CONDENSING UNIT

THE following article is a brief resume from a recent talk by Mr. Ernest Gygax, chief engineer of the Curtis Mfg. Co., St. Louis, before St. Louis Chapter, R.S.E.S. on the results of tests he conducted on condensing units.

He received his engineering education in Swiss and German universities and has had many years experience in designing compressors for air, gas and refrigerants.

Mr. Gygax described the action of reciprocating refrigeration compressors using a cutaway two cylinder model of the Curtis compressor and various blueprint charts of indicator diagrams and the like. By means of the actual cutaway, he pointed out that it is not possible for a piston to strike the head of the compressor, thereby making it impossible to eliminate a clearance space above the piston. He further pointed out how the gas in this clearance space re-expanded on the down stroke, cutting down the volumetric intake of the stroke until the compressed gas in the clearance space has re-expanded down to a little below the low pressure of the refrigerating system before the piston actually begins to take in low pressure gas through the intake port or valve.

By means of a large blueprint of an indicator diagram, Mr. Gygax showed how a compressor working at a 50-pound pressure would lose a certain part of the back stroke on re-expansion, about 6 or 7%, and when the pressure against wnich the compressor was pumping was increased to 100 pounds, this loss due to re-expansion of the gas in the clearance space practically doubled, making the volumetric intake loss nearly 15%.

He stated that a compressor could be started pumping against a given pressure, say 100 pounds, and at the start would deliver a certain stated capacity of compressed gas. After this compressor had run for a period sufficient to heat up to the maximum point due to the compression of the gas and the general friction of the unit, possibly one to two hours of running time, the compressor would show a capacity 10% to 15% less than the capacity of the compressor when cold. He explained that this was due to the fact that the piston, cylinder head and cylinders became heated and that the incoming low pressure gas striking the hot surface of the cylinder, piston, and head, likewise became heated and expanded, thus cutting down the volumetric intake capacity from 10% to 15% due to the heat of the compressor itself.

Piston Ring Loss

Mr. Gygax showed that very careful tests made by himself showed a loss past the piston rings of but 4% to 8%. The 4% was obtained by very closely fitted pistons and extremely accurately fitted rings well run in. He stated that "fancy" ring constructions advertised and touted by various manufacturers did not show any appreciable lessening of this slip past the rings, but that a plain step-cut ring properly fitted and well run in showed as little loss past the ring as any he tested, and a large number were tested including many fancy or special shapes of the so-called leak-proof type.

Result of Tests

One interesting experiment performed by Mr. Gygax in the laboratory was described as follows: A standard 1⅝ inches by 1⅝ inches single cylinder, one-quarter hp. reciprocating condensing unit was disassembled. A very accurate watt-meter was then connected in the motor circuit. The motor was run without any belt attached. The watt-meter showed the load at this time of the motor alone, that is, the current required to pull the motor itself. Next, the shaft was inserted in the crank case of the compressor with a flywheel and this was belted to the motor, thus giving the loss of the motor, the belt, and the friction of the main bearing only. Next, the seal was added to the crank shaft. Next, the connecting rod and piston were added without rings. Next, rings were added to the piston. Next, the valve plate was put in place and the compressor made to pump against 75 pounds pressure, which is about the pressure of the sulphur dioxide unit. The various watt-meter readings obtained in the above described process were as follows:

¼-hp. motor only, running free	60 watts
Motor, belt, and crank shaft main bearings	120 watts
Seal added	135 watts
Connecting rod and piston added	165 watts
Two rings added to the pistons	175 watts
Valves added and compressor pumping against 75 pounds pressure	295 watts

From the above tests, it will be seen that of the total load of 295 watts, only 120 watts were actually working on the compressing of the refrigerant gas itself, the other 175 watts being lost. Then, by standard test methods, Mr. Gygax determined that after the unit became heated, its capacity would be still further reduced from 10% to 15% in compressing capacity of refrigerant without any reduction in electric current consumption.

ADDITIONAL UNITS ADDED TO ROTARY SEAL LIST

NINE additional units have been recently added to the Rotary Seal replacement list to include a number of replacement seals for additional compressors. The present list comprises units for 41 machines, and a late stock list showing the additional machines for which Rotary seals are now obtainable, is being distributed. These lists are published periodically for the convenience of service men and can be secured through Rotary Seal distributors or direct from the manufacturer at 805 W. Madison St., Chicago.

ROBERT MILLEN BABBITT, DECEASED

MEMBERS of the refrigerating industry and the staff of THE REFRIGERATION SERVICE ENGINEER were greatly shocked to hear of the death on Saturday, August 31, of Robert M. Babbitt, vice-president and manager of advertising of Nickerson & Collins Co., publishers. Mr. Babbitt had gone to Milwaukee on Thursday and planned to continue from there on a several days' business trip. Not feeling well, he decided to return to his home at 1781 Wesley Ave., Evanston, Ill., Friday, and continue his interrupted trip from there after Labor Day. His condition became worse and he was taken to the Evanston Hospital where he passed away Saturday afternoon, at 4:00 p.m. Death resulted from a heart attack. He was fifty-seven years old.

Born in Jersey City, N. J., Mr. Babbitt received his education at Lawrenceville School and New York University. He moved to Evanston twenty years ago, at which time he was connected with the Mc-

THE LATE ROBERT MILLEN BABBITT.

Graw-Hill Co., Publishers of New York City. Two years later he became associated with Nickerson & Collins Co. as manager of the advertising department, and later became vice-president of that company. He was a member of the University Club of Evanston, of Paul Revere Lodge 998 A.F. & A.M., and of Medinah Temple.

Mr. Babbitt was well and favorably known throughout the refrigerating industry where he was known affectionately as "Bob," and where he had made numerous friends and business acquaintances. The executives with whom he came in contact and with many of whom he was more than an acquaintance, had always held him in highest regard and his loss will be keenly felt by them as well as by his other friends and office associates. Probably no more pleasing tribute could be paid to his memory than to mention the large number of letters received in the office of THE REFRIGERATION SERVICE ENGINEER, coming from all sections of the country, expressing in terms of warm friendship keen regret at his untimely passing and mentioning pleasant contacts of the past.

The REFRIGERATION SERVICE ENGINEER

A Monthly Illustrated Journal, Devoted to the Interests of the Engineer Servicing Refrigeration Units, Oil Burners and other Household Equipment.

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Official Organ
REFRIGERATION SERVICE ENGINEERS' SOCIETY

ETHICS

THE editor's desk has been the recipient of numerous complaints regarding the practice of some parts distributors in not recognizing the service man as a preferred purchaser as compared with other retail purchasers.

No one questions the justification of this complaint, and it is hoped that such practices will be stopped at their source as it is natural to assume that the service man, in the protection of his interests, will not sit idly by and condone such practices.

SECOND R.S.E.S. CONVENTION

THE Second Annual Convention of the R.S.E.S. is but a matter of a few weeks. Detroit, the center of refrigerator manufacturing, will act as host to the visiting service men. Advance reports indicate a most successful convention, and the program now arranged holds considerable promise from an educational standpoint for those who will be in attendance.

The Society, at this convention, will be in a position to report definite accomplishments in advancing the interests of those engaged in the servicing field. Association meetings, such as this convention, stimulate business activity and go a long way in encouraging a definite standard of practice for the advancement of its members and the future progress of the industry which they represent. The Society has a considerable task before it, but with the accomplishments that it can record and the sincere cooperation and encouragement which it has received from every source, it is to be anticipated that its program will continue in a greater way than ever before and that this organization will represent an active, potent force in the advancement of its members.

INSTALLATION STANDARDS

IT has been proposed that a uniform standard of practice for installation work in the servicing field would be most advantageous both to the manufacturer and consumer. Practically every large industrial field has found it advisable to adopt uniform practices, and assuredly this field is no exception. The adoption of such uniform practices would encourage the installation of first class work.

Some municipalities, through their regulatory measures, have certain standards which must be adhered to, but the thought behind this particular work would be to adopt uniform practices that would be universally employed by all interested in this field. The purchaser would know that certain standard practices are recommended, and that installations following such standards will result in satisfactory work.

The commercial field of refrigeration is vitally in need of such standards of practice, and it is hoped that something of this nature can be worked out for the good of all.

Ralph J. Schmisseur,
Illinois.

Although my present subscription does not terminate until January, I am sending remittance for renewal as the Yuletide period is approaching and I do not want to take chances on missing any issues.

All Aboard

for the Second Annual Convention

and Manufacturers' Exhibit,

Refrigeration Service Engineers' Society,

Detroit, Mich., Hotel Fort Shelby.

Three Days, October 23, 24 and 25

Every Refrigeration Service Man Is Invited

ALL ROADS LEAD TO DETROIT AND THE SECOND ANNUAL CONVENTION OF THE R.S.E.S.

THE program has been completed, and from an educational standpoint, both as to the papers which will be presented at the morning sessions and the actual visits to the plants in the afternoons, it will be a valuable education to every service man, irrespective of the years of experience which he may have had in this field. Subjects of vital interest to you will be discussed during the educational program of the convention, and definite action on matters of importance to all service men will be acted upon.

For the service man, it is the most important conference of the year. This convention will emphasize the definite progress the Society has made in carrying out the purposes and objects for which it was founded.

The Detroit convention committees have been hard at work in providing not only an interesting and valuable educational program, but also arranging for the entertainment of the guests during the evening.

In this connection, provision has been made for the entertainment of the ladies. A cordial invitation is extended to the ladies to attend this convention and to participate in the entertainment to be provided.

The list of exhibitors, who will have on display the latest refrigeration accessories with capable engineers in charge to explain at first hand their various features, will be an interesting part of the convention program. A complete list is published elsewhere in this issue.

Make your plans now to be in Detroit on the opening day of the convention session—Wednesday, October 23. The official hotel is the Fort Shelby, conveniently located at LaFayette and First Streets.

AN INVITATION FROM THE PRESIDENT

My Fellow Service Engineers:

As you will learn from other reports appearing in this issue of our official organ, the details and program for our Second Annual Convention are now complete. It is gratifying to me to learn from so many sources of the interest that has been shown in this annual meeting of service men, which, by the way, is the only annual conference of the men engaged in both field and shop in the servicing and installation of domestic and small commercial refrigerating equipment.

Inasmuch as very few weeks separate us from the opening session of the convention, I take this opportunity of extending a cordial welcome to the members of the R.S. E.S. and to all other service men interested in participating in the educational program of this important meeting.

I am looking forward with much pleasure to renewing the personal acquaintances made at our last annual meeting and extending my acquaintanceship to many new friends who will be in attendance at this meeting. The Detroit boys are to be highly congratulated on the plans which they have made for the entertainment of the visiting guests, and I feel sure that their efforts will be amply repaid in the pleasant memories each of us will carry away from the Detroit convention.

Definite accomplishments have been made by your association in advancing the interests of the service men this year—but more of that will be outlined to you during the convention. I confidently expect that this convention will take steps to insure the rapid expansion this Society has enjoyed. Your National Officers are concerned with the advancement of the business that we all depend upon for our livelihood, and I can assure you that your constructive suggestions always find a welcome reception in carrying out the purposes and objects of our Society. We have all conscientiously endeavored to carry out the best policies of our organization in your interests.

Cordially yours,

THOMAS J. FOWLER, National President.

THE EXHIBITORS

THE manufacturers' exhibit presents an education in itself. In this exhibit will be found representative manufacturers of refrigeration accessories and distributors who will display their equipment for inspection of the service man. The list of exhibitors participating include the following:

Refrigeration & Air Conditioning Institute, Chicago.
Electrimatic Corp., Chicago.
Rotary Seal Co., Chicago.
Utilities Engr. Inst. & Airo Supply Co., Chicago.
Automatic Products Co., Milwaukee.
George Monjian Company, Chicago.
Standard Refrigeration Parts, Chicago.
American Injector Co., Detroit.
Wolverine Tube Co., Detroit.
The Starr Company, Richmond, Ind.
Fedders Mfg. Co., Buffalo, N. Y.
Detroit Lubricator Co., Detroit.
Virginia Smelting Co., West Norfolk, Va.
Alco Valve Co., St. Louis, Mo.
Automatic Reclosing Circuit Breaker Co., Columbus, Ohio.
Kerotest Mfg. Co., Pittsburgh.
Ansul Chemical Co., Marinette, Wisc.
Henry Valve Co., Chicago.
Copeland Refrigeration Co., Detroit.
McCord Radiator & Mfg. Co., Detroit.
Imperial Brass Mfg. Co., Chicago.
Minneapolis-Honeywell Reg. Co., Minneapolis.
Dole Refrigerating Co., Chicago.
Frigidaire Corp., Dayton, Ohio.
Trico Compressor Service, Chicago.

TO THE LADIES

THE ladies are expected and invited to participate in the Second Annual R. S. E. S. Convention. It is hoped that the readers of this magazine will show this invitation to the ladies. The following letter from Mrs. Joseph Oberc is a cordial invitation from the Detroit Committee to all the ladies.

Dear Madam:

You are cordially invited to attend the Refrigeration Service Engineers' National Convention, scheduled to be held in Detroit,

Mich., Oct. 23rd, 24th and 25th, with headquarters at the Hotel Fort Shelby, Lafayette and 1st Sts., and to participate in the activities, entertainment, etc. which have been planned for the ladies during this Convention.

For the first day of the Convention, Wednesday, Oct. 23rd, we have arranged a tour of Henry Ford's Greenfield Village, which has been erected at a large expenditure, and which affords you a personal inspection of reconstructed historic buildings, and institutes, early furniture, machinery, etc., and depicts home and community life —all of which have been the very foundation in the formation of our present day life, government, etc. A bus has been provided to pick you up at the Hotel Fort Shelby at 1:30 p. m. and transport you to the Village and back to the hotel at 5:00 p. m.

For Thursday, Oct. 24th, a card party is scheduled to take place in the Green Room of the hotel. The Green Room is located on the second floor, and the party will take place at 2:00 p. m. Prizes will be awarded to winners.

In addition to the above (which is strictly for the ladies) there is to be an Exhibitors Frolic Wednesday evening, and a dinner-dance Thursday evening, at which time Mr. Evan Hughes has arranged for a wonderful meal—in addition to a great orchestra and entertainment. The Hotel Fort Shelby is unsurpassed when it comes to serving appetizing foods, and we hope that all who attend the Convention will find time to attend this dinner-dance.

No plans have been made for Friday—merely to afford all visitors and guests an opportunity to visit friends, relax, or personally take in any points of interest.

Please feel that this is your party! It has been uppermost in the minds of the Entertainment Committee to arrange plans that would suit and please the greatest number of guests. Your whole-hearted cooperation in making the Convention activities a success are solicited.

Very truly yours,
D. L. Oberc, Chairlady,
Ladies' Entertainment Committee.

HOTEL RESERVATIONS

MAKE reservations direct to the Fort Shelby Hotel, Detroit, advising accommodations required. The meetings of the Society as well as the manufacturers exhibit will be held in the Spanish room of the hotel. The Fort Shelby is located at Lafayette Boulevard at First Street.

THE PROGRAM

WEDNESDAY—October 23

9:00 A. M.—Registration.

Call to Order by President J. H. Downs of Detroit Chapter and Address of Welcome.

9:30 A. M.—Introduction of National Officers.

Address—J. F. Nickerson.

9:45 A. M.—Address of National President T. J. Fowler.

10:00 A. M.—Appointment of Committees and Announcements.

10:15 A. M.—Report of National Secretary H. T. McDermott.

Report of National Treasurer E. J. Merenda.

10:30 A. M.—Progress Made in Educational Program and Looking Forward to 1936 —By George H. Clark.

11:00 A. M.—The Necessity for Adopting Uniform Symbols for the Refrigeration Field.

Report of Committee on Uniform Cost Accounting System — By Harry Drownes.

The Advantages of a Universal Credit System for the Service Field—By H. P. Scher.

Adjournment.

Afternoon

Visit to Kelvinator Plant.

Ladies' Trip to Greenfield Village.

Evening

Exhibitors' Frolic.

THURSDAY—October 24

9:00 A. M.—Call to Order.

Question Box.

9:30 A. M.—Truck Refrigeration—By Mr. Burman, Kold-Hold Mfg. Co.

10:00 A. M.—How to Conduct a Service Organization from a Financial Standpoint—By E. A. Siebert.

10:30 A. M.—Toxicity—By H. V. Higley, Ansul Chemical Co.

11:30 A. M.—Our Future Progress—Herman Goldberg.

12:00 A. M.—Talk on Air Conditioning—Speaker to be announced.

Two 10-minute Talks by Manufacturers.

Report of Nominating Committee and Election of Officers.

Afternoon

Visit to Wolverine Tube Co.
Ladies' Bridge Party at the Fort Shelby Hotel.

Evening

Annual Banquet.

FRIDAY—October 25

9:00 A. M.—Call to Order.
Question Box.
9:30 A. M.—Automatic Oil Separators and Commercial Installations—F. B. Riley.
10:30 A. M.—What is expected of the Independent Service Man—E. Barger, Universal Cooler Corp.
General Discussion by Members.
Invitations for Next Convention City.
11:30 A. M.—Reports of Convention Committees.
Unfinished Business.

Afternoon

Alternative visits to various Detroit refrigeration accessory manufacturing plants.

Evening

Entertainment by Detroit Chapter.

DETROIT CHAPTER

Meeting of September 18th

By J. E. PERRY, Secretary

THE meeting was called to order by President Downs, who introduced Mr. Chas. Clemens of United Motors, our host for the evening, to the boys who failed to attend the last revival. Mr. Clemens welcomed the boys and announced that shortly United Motors would enter into the compressor repair business. He gave a short talk on their business policies and promised the R.S.E.S. the continued support of the United Motors. In concluding, he passed out a nice little gift to almost all the boys. I say almost, because we certainly had a very nice turn-out, about sixty-five attended, and provisions had not been arranged to take care of that number. However, everything will be in better shape for the next meeting and Mr. Clemens has promised that there will be enough to go around.

Mr. W. Corsan, of the well known A. B. C. Refrigeration Service, said a few words regarding a Bowling League. The boys liked the suggestion very well and Mr. Corsan was made chairman and authorized to make arrangements for alleys. The boys who wish to form teams are to contact Mr. Corsan this week.

Mr. McKerracher, of Redford Refrigeration Service, who next had the floor, was kind of hot under the collar and spoke rather forcefully regarding refrigeration suppliers who disregard the service engineer and sell direct to the ultimate consumer at the service man's cost. This is a very bad condition that we have here in Detroit, and it comes to our attention every once in a while. The one or two suppliers who go in for this sort of thing are well known to all of us, and inasmuch as this is our business, our daily bread and butter, and one of the first laws of nature is to fight for what is yours, I should think that we as an organization could put a stop to this unfair practice.

The Business Committee of the Detroit Chapter, realizing the importance of licensing and bonding all refrigeration contractors, went so far as to retain an attorney to draw up a new refrigeration ordinance covering also the control of the sale of refrigerants. To this end, we obtained the services of Mr. Phillip Neudeck, a former assistant prosecuting attorney, who was next introduced by President Downs. Mr. Neudeck's topic was "Protecting Your Business with an Ordinance." And he made quite a hit with the boys.

Mr. Downs gave a report on the convention, and Mr. Evans on the convention program. Refreshments were served by Mr. Clemens of United Motors, and a good time was had by all.

CLEVELAND CHAPTER

Meeting of September 11th

By K. P. WALL, Secretary

THE meeting was called to order by President Farr, and twenty-one members and one visitor were present.

Mr. Wm. Weiss was introduced as a new member, and since he is connected with the

Chase Brass & Copper Company, he offered on behalf of his company to put on a demonstration of sweat fittings at our next meeting. His offer was accepted.

Discussion was held about the R.S.E.S. convention at Detroit, and indications are that Cleveland Chapter will be well represented.

The next discussion was about the forming of a Credit Exchange and Mr. Lawrence Gardella was appointed chairman of a committee to make recommendations for such an exchange. Assisting him are Otto Sipple and William Meder.

Meeting of September 25th

After the usual opening of the meeting and roll call, the meeting was turned over to Mr. Wm. Weiss of the Chase Brass & Copper Company, and a most interesting demonstration of sweat fittings was given us

KANSAS CITY CHAPTER

Meeting of August 20th

By C. F. RAMEY, Secretary

THE meeting of August 20th was held at the Commonwealth Hotel, 12th and Broadway, Kansas City, Missouri.

President Leitner explained in detail the procedure followed in acting on applications from new members. Some criticism had been received on account of the delay in hearing from applications submitted. Whatever can be done to expedite action will be taken care of at once. Considerable discussion ensued regarding applications from parts dealers and part-time operators. Disposition of such applications is, of course, up to the Membership Committee and Board of Directors.

An urgent request was made for dues. Quite a number of our members are a little tardy and funds are needed to carry out planned educational work ahead.

The matter of credit information among members was discussed further and the decision that the dispensing of this information was a matter to be handled between the members themselves was concurred in by the majority of members present.

Mr. W. R. Jones, chairman of the Educational Committee, outlined plans ahead for study of the lectures and material received to date. Successful results require cooperation of all members which he requested and which was promised by all present.

Special communication from National Secretary McDermott was read outlining convention plans and conveying the hope for a good turnout from Kansas City Chapter. The Program Committee is anxious to secure the expressions from members as to the subjects on which they desire discussions at the national convention so that the most interesting talks for all can be arranged.

Mr. Leo J. McCormick, city electrician, was introduced and gave us a very good talk. Mr. McCormick came not only as City Electrician, but also as a prospective member for our Chapter. For some time he has been interested in the refrigeration and air conditioning field and just recently entered actively in the engineering and servicing work as head of the Acme Refrigeration Service, with Mr. D. D. Pollock, already one of the active members, as superintendent of service. A cordial welcome was extended to Mr. McCormick as we feel sure that with his valuable experience, he can render our Society helpful assistance.

Meeting of September 10th

The meeting of September 10th was held at the Commonwealth Hotel, 1216 Broadway, Kansas City, Mo.

Special communications read: one a letter from Mr. E. A. Plesskott, secretary of St. Louis Chapter, regarding the plans of several members of their chapter to attend the national convention in Detroit, and an invitation to any of our members to join them in taking a bus from St. Louis for the trip. Another communication was from National Secretary McDermott telling of the good things in store for all at the convention.

New applications were received from Otis Clark, Max Weis (with Ace Electric Service), and Byron L. Smith. These were turned over to the Membership Committee for attention.

A report from J. L. DeWilde, chairman of the Committee on Standards, was received and read. Suggested prices for motor repair work and for compressor overhauls

were made, this schedule of prices to be offered to the members for comment and criticism and returned to the Committee for further study.

At this point in the meeting, the resignation of our treasurer, Miss Jane Merritt, was presented. Miss Merritt regretfully informed us that she had disposed of her refrigeration service business and has had presented to her the very wonderful opportunity of a trip to Europe. Our membership could take no other action than to accept Miss Merritt's resignation. A vote of thanks was extended to her for service rendered, with best wishes from all for an enjoyable and interesting trip abroad.

It was thought advisable to combine the duties of the Treasurer's office with those of the Secretary for the balance of the year. Accordingly, Secretary Ramey will act as temporary treasurer until the next election of officers is held.

Mr. Roberts, of Forslund Pump and Machinery Co., handling refrigeration equipment supplies, acknowledged an introduction with a brief talk assuring us of the continued interest in our local chapter of their firm.

Mr. C. O. Kester, another visitor, speaking for himself and visiting associates, G. L. Anderson and O. E. Kester, assured us of their interest and felt sure we could expect representation from their company, Copeland Refrigeration Co., at future meetings.

There being no further business, the meeting was turned over to Mr. W. R. Jones, chairman of the Educational Committee. The first lecture in the series of refrigeration lectures was gone over briefly. The lateness of the hour necessitated cutting the study period short, but the fact that we were making a start was encouraging to all, and our next meeting should show progress being made.

S S S

CHICAGO CHAPTER

Meeting of August 27th

By H. D. BUSBY, Secretary

THE meeting was called to order at 8:30 P. M. Roll call of officers revealed those present—Messrs. Jacobsen, Roth, Skipple, Busby and Forman.

Mr. Jacobsen requested that those members who sold tickets for the recent stag turn in the proceeds of their sales as soon as possible.

Mr. McDermott was asked to gather what information he could for the next meeting night regarding bus and train rates to Detroit for the coming Convention. Mr. McDermott promised to do this and at the same time gave some interesting information on what can be expected in the way of accommodations, entertainment and educational matter at the Convention. He also pointed out that arrangements are being made for the entertainment for the ladies.

Mr. Drownes, reporting for the Committee on the Credit Information Bureau, read a letter from Mr. Scher outlining a partial plan for a clearing house and credit bureau. Considerable discussion followed and it was finally brought out that this matter is to be brought up for consideration at the National Convention, and until after that time, it was decided to let the matter rest.

Mr. Goldberg, reporting for the Entertainment Committee, suggested, as a winter entertainment, the forming of a bowling league. Several suggestions were made and it was decided that the first Tuesday of each month would be the most suitable meeting time.

Mr. Hagey, of the Dole Valve Company, was introduced as a visitor and gave a short talk on the Square D high and low side pressure controls, a sample of which he demonstrated. He also showed a high and low pressure switch in combination with a magnetic starter.

Mr. Jacobsen gave a very interesting talk on the servicing of carbonators and suggests this work as a suitable winter fill-in for the refrigerator service man.

Meeting of September 10th

The minutes of the previous meeting were read and approved with the exception of one correction as follows: Mr. Hagey, of the Dole Valve Company, it was stated, was introduced as a visitor and gave a talk on the Square D high and low side pressure control. This was corrected to Mr. Esterling of the Square D Company, who was in-

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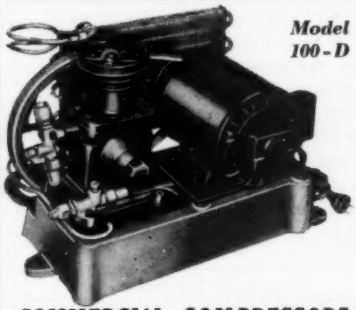

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troduced as a visitor and gave the aforementioned talk.

A report from Mr. Goldberg revealed that there is still a balance of $35.00 to be collected on tickets sold for the stag party of a few weeks past. Mr. Goldberg has expressed the desire to utilize this $35.00 when collected, for the purpose of a get-together within the next two or three weeks.

Mr. Jacobsen read the educational and entertainment programs for the coming National Convention to be held in Detroit and urged as many members as possible to attend.

Mr. Goldberg informed us that a round-trip bus rate on the Greyhound Busses can be secured for the total amount of $7.00. Rates for ten or more can probably be procured at a 10% discount.

Announcement was made of an examination for Certificate Membership which will be held on the first Tuesday of October in the offices of Nickerson & Collins Co., 433 North Waller Ave., Chicago. As many members as possible are urged to take this examination.

Meeting of September 24th

Mr. Jacobsen read for the second time, the program of the National Convention to be held in Detroit and urged as many members as possible to attend and bring their wives. It was pointed out that the cost per member could be as low as $25.00, including all expenses.

Nominations for a delegate and alternate to the convention were received and Mr. Drownes, Mr. Goldberg and Mr. Roth were nominated. Mr. Goldberg later withdrew, and Mr. Drownes was elected delegate and Mr. Roth alternate.

Previous to the meeting, a radio had been set up in the meeting room for the purpose of listening to the Louis-Baer fight and at this time, the meeting was temporarily adjourned and members gathered around the radio to learn the good or bad news according to the bets they had made.

The educational program for the evening consisted of questions and answers on the national educational bulletins and an open discussion of same.

Mr. Goldberg announced that eats and refreshments, a gift of Mr. Scher, would be on hand for the next meeting. He also announced that $20.00 of the $35.00 outstanding from the stag party had been collected and asked a donation of $5.00 from the Chapter Treasury to add to this $20.00 in order to put on a get-together for members in the near future. He suggests the ladies be invited.

Mr. Drownes, reporting for the Credit Bureau Committee, gave a repetition of his previous report for the benefit of those who were not present at that time.

Meeting of October 8th

The meeting was called to order at 8:45 P. M. Officers present: Messrs. Northcote, Roth, Busby and Forman.

In the absence of President Jacobsen, Mr. Northcote, first vice-president, conducted the meeting.

One application for membership was received and read.

Among the correspondence read was a letter from President Jacobsen expressing his regret in not being able to attend the meeting and explaining he was taking this opportunity of a short vacation.

The instructions to our delegate to the convention, which had been previously prepared, were read, discussed and approved.

The educational program for the evening was the reading and discussion of the problems presented in the examination for Certificate Membership by Mr. Northcote.

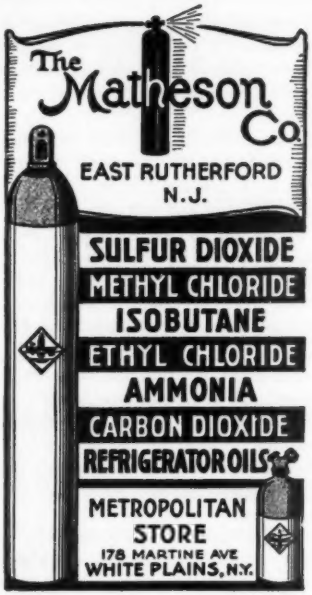
Mr. Drownes, chairman of the Credit Reporting Committee, had nothing further to report.

Mr. Goldberg, reporting for the Entertainment Committee, promises nothing until about one month after the convention, at which time he proposes putting on a party for the members and their wives and friends which he wishes to call "Past President's Night" in honor of our Past President, T. J. Fowler. A definite date and further details of this will be forthcoming in the future.

Mr. Fowler, in a short talk, described some of the good things to be expected at the convention.

In taking a poll of those who intend to go to the convention, promises were received from eighteen members.

Attendance for the evening was fifty-five.



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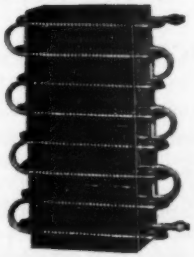

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PITTSBURGH CHAPTER

Meeting of September 9th

By F. V. GOLITZ, Secretary

THE regular meeting of the Pittsburgh Chapter was held on Sept. 9, 1935, in the Corporation Room of the Commonwealth Building. The meeting was attended by thirty-five men, President C. O. McCauley presiding.

Mr. McCauley read the correspondence. This was followed by a discussion of the Detroit Convention by the assembly. At the suggestion of the President it was decided to postpone the naming of the delegates to the convention until the October meeting.

It was moved by Mr. Kirch and seconded by Mr. Kane that the Secretary buy the necessary stationery and office supplies. Motion carried.

Mr. McCauley asked that each member make an effort to bring at least one new member to the next meeting.

The need for and the advisability of having a Refrigeration Code for the City was discussed at length.

Mr. McCauley gave a short talk on "High Side Float Systems." A discussion of service problems on this type of system followed.

S S S

CHICAGO CHAPTER CHATTER

By HERMAN GOLDBERG

IT'S all over but the shouting now. All arrangements are completed for our big time in Detroit and our gang from Chicago certainly is going to be there with bells on.

—It surely is going to be grand to meet the fellows from the other chapters and, unquestionably, this great convention of ours is going to definitely pave the way toward better harmony between the various chapters, and above all, it ought to show the industry in general the important position that the service organizations hold.

—Our next meeting will probably be the last before the convention, and our member, Lawyer Herman P. Scher, has very graciously offered to supply beer and skittles after the meeting ceremonies.

—The entertainment committee may change its plans to hold off its little affair, which was tentatively arranged for October 19th, until after the convention, as quite a number of the boys expressed their viewpoint on having these two affairs so close together.

—Incidentally, at our next meeting, our genial president, Mr. Jacobsen, will be absent as he is leaving for an extended trip through the East and will come back to Chicago by way of Detroit so that he and Mrs. Jacobsen may enjoy the convention with the rest of us. *But,* in his place presiding over our next meeting, we will have none other than our vice president himself, Mr. John Northcote, who undoubtedly will preside with great decorum and dispatch.

—Well, I'll be seeing you fellows at the convention, and if you want me for anything, I shouldn't be hard to find as our booth is number 8, and all the Chicago boys are invited to make booth number 8 their general headquarters.

—In the meanwhile, if anything else comes up, don't fail to call me at Austin 6343 or mail your notes to me at my office, 5101 W. Madison St.

S S S

ST. LOUIS CHAPTER

Meeting of September 12th

By E. A. PLESSKOTT, Secretary

THE regular meeting held at the Crunden Branch Library, was called to order by President Gray at 8:30 P. M.

Mr. Greathouse and Mr. Prietzel, two prospective members, were introduced, but for the time being had no comments to make.

Mr. Gray and Mr. Plesskott again advised the members to make all possible effort to attend our convention in October.

Mr. Kreuger reported for the Membership Committee, and gave it as his opinion that things are looking up, even though he did not have any new applications.

Mr. E. W. Erny of R. E. Felling and Company, representing the Hinsdale Tool Company in this territory, has invited us to hold our October 10th meeting in their office, after which they will serve the Chapter with refreshments. All this is in appreciation of the refrigeration service man's acceptance of Hinsdale Tool Company products.

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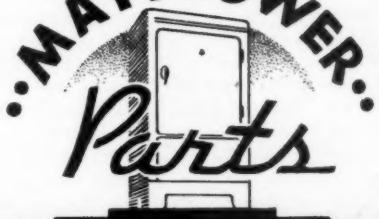

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A motion was regularly made and seconded that we accept this offer, and on being put to a vote, carried unanimously.

The Secretary called attention to the fact that our meeting of October 24th falls on the same day as one of the convention dates, and inasmuch as the officers had intended to attend said convention, that it might be well to consider meeting the Thursday previous or the Thursday following, or calling our second Thursday meeting off completely; but as there will be five Thursdays in the month of November, he suggested that we call a special meeting for Thursday, October 31 and at that time have those who were able to attend the convention give reports on its various activities.

A motion was regularly made and seconded that we call a special meeting for October 31st, at 8:00 P. M. in place of our regular meeting of Thursday, October 24. On being put to a vote, there were no dissenting voices.

Meeting of September 26th

The minutes of September 12th were read and approved as read.

The speaker of the evening being unable to attend, the evening was spent discussing the advisability of making a bid for the convention of 1936, with the proponents and opponents fairly evenly divided.

Mr. O. G. Tinkey supplied the Chapter with considerable food for thought with his plan for the raising of the much needed funds, as well as new members, and in the very near future a committee will be appointed to go into detail as to the possibility of carrying it into execution.

President Gray advised all present that he would have bus tickets at our next meeting and for the members who intend going to be prepared to take these up, and give the Secretary an idea as to what kind of hotel accommodations they desired, if they had not already made their reservations.

He also advised that all members in arrears for dues will have until the 22nd of October to get paid up to remain in good standing, and all 1936 dues will have to be paid into our treasury on or before March 1, 1936 in order for each member to continue to receive his lectures, educational papers and official organ. The reason for making this announcement so early was to give ample time in which to prepare.

At our next meeting, it was decided to invite all refrigerator service men in this vicinity, in order to get acquainted and partake of the refreshments so graciously offered to us by the Hinsdale Tool Company.

President Gray thanked the many men for turning out on so miserable a night and assured them that as long as he is an officer of this body, never again will we be without a speaker, after one has been programmed, as he personally intends to contact them.

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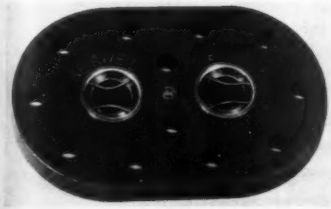

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All dimensions are tabulated in condensed form, and the brief descriptive matter is very clear. While not as complete or decorative as the company's large catalog in colors, it is probably the best small handbook in the trade.

S S S

HARRY ALTER COMPANY OPENS THREE BRANCHES

THE Harry Alter Company, one of America's fastest growing refrigeration parts and supply houses, has just announced the opening of three branch houses. Two of the Alter branch houses are located in Chicago, one at 5217 West Madison Street, and the other at 4611 North Western Avenue. The third branch established is in St. Louis, Missouri, at the corner of Washington and Jefferson Streets.

The following appointments have been made according to Irving Alter, secretary of the company: the West Madison Street branch in Chicago is managed by Joseph Hollub, the Western Avenue branch in Chicago is under the management of Henry Spivak, and Mr. B. F. Anthony of St. Louis, Missouri has been appointed manager of the St. Louis branch of the Alter Company.

Mr. Alter states that in each of the branches, a complete and well arranged stock of refrigeration parts and supplies is being maintained at all times. In fact, everything that is shown in the company's catalog, known as "Harry Alter's Dependabook" is carried in stock at the branch houses, consisting of several thousand items.

Quoting from Mr. Alter's statement, "for the past year and a half it has been the policy of the Harry Alter Company to check carefully every request for a catalog, as well as investigating the legitimacy of every order that is placed with the company. We have found in our past experience that unless a careful check-up is made along such lines, it is possible for a wholesale catalog to get into the hands of people not entitled to buy at wholesale prices. This, of course, works a great wrong on the industry, and does the trade irreparable harm. For this reason, we have set up in our offices, a very comprehensive and carefully worked out plan of checking all orders and inquiries from new customers to determine definitely whether they are entitled to wholesale prices or not. We feel that this effort on our part is fully justified in maintaining better markets for refrigeration service men."

Service men have spoken very highly of the large and widely assorted stock carried by the company, and also the splendid shipping service that the company is able to render.

S S S

NEW DISTRIBUTOR FOR VIRGINIA SMELTING COMPANY

ANNOUNCEMENT has been recently made of the appointment of The Smedley Company, 165 Brewery St., New Haven, Conn., as a distributor for the Virginia Smelting Company on their "Extra Dry Esotoo" and "V-Meth-L" (Virginia Methyl Chloride). This new distributing point has been established to better serve the service industry in the territory of New Haven.

S S S

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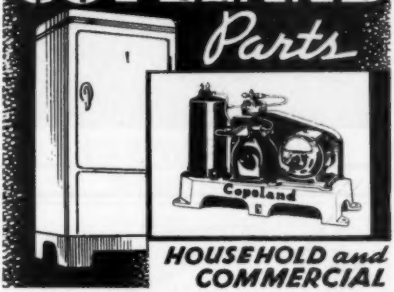

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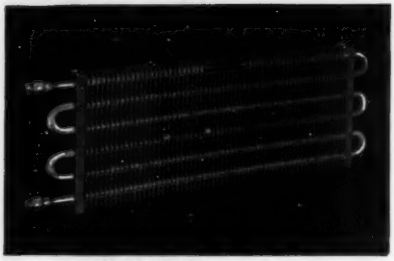

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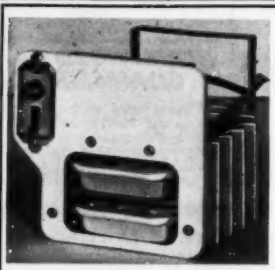

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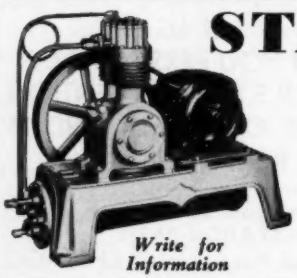

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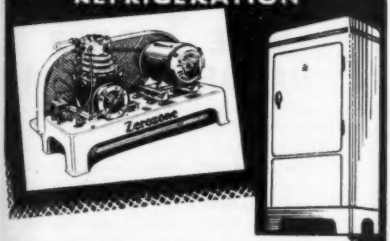

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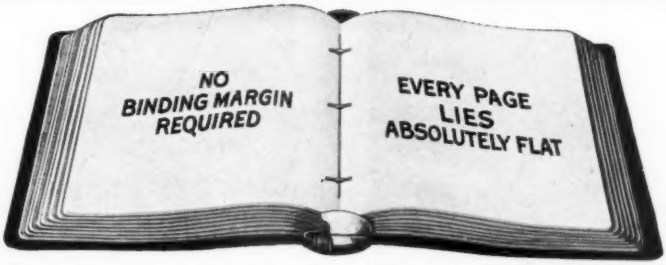

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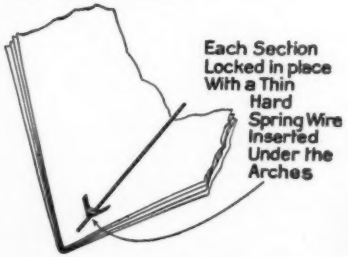

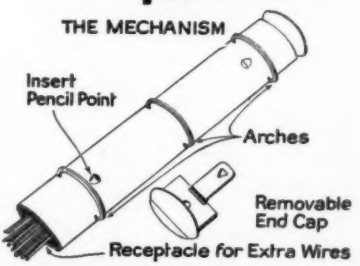

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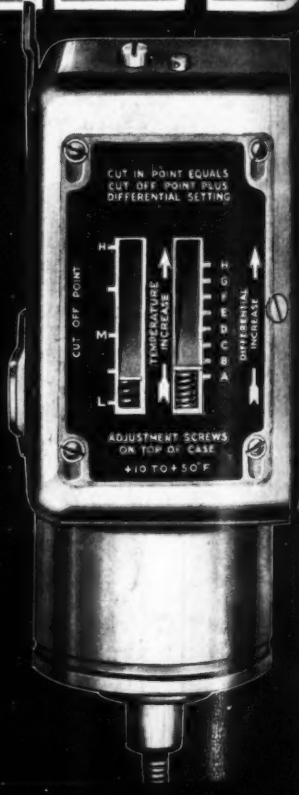
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